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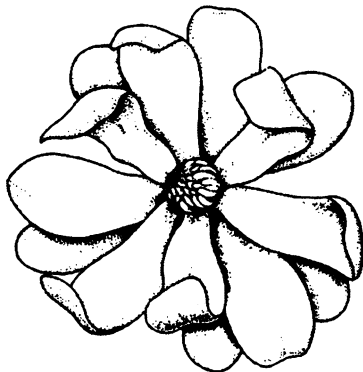
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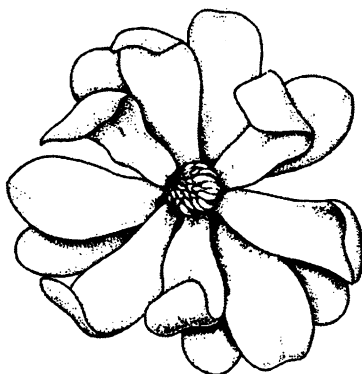
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THE AMATEUR ORCHID CULTIVATORS' GUIDE BOOK.

BY

H. A. BURBERRY, F.R.H.S.,

LATE ORCHID GROWER AT HIGHBURY, BIRMINGHAM (THE RESIDENCE
OF THE RIGHT HON. JOSEPH CHAMBERLAIN, M.P.)

CONTRIBUTOR OF THE FOLLOWING, VIZ.:

THE YEARLY CALENDAR OF OPERATIONS ON ORCHID CULTURE FOR
THE "ORCHID REVIEW," 1894 AND 1895; THE ORCHID
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PREFACE.

THE Second Edition of this work being exhausted it has been thought desirable to issue a Third Edition. It is a source of the utmost gratification to me to learn from the letters of a large number of readers that the work so well answers the purpose for which it was intended, viz. :—That of a text book conveying to the beginner information calculated best to assist him to take up, with reasonable chances of success, the beautiful study of orchids and their culture. To these correspondents, as well as to the Editors and Reviewers of the gardening periodicals, I beg to offer my grateful thanks for pointing out faults, as well as bestowing so much greatly appreciated praise of the book. Some few have suggested a considerable enlargement, so as to embrace practically the whole of the species known to cultivation. While acknowledging this would be a great improvement I need hardly say it would at the same time greatly add to the size of the work and consequently the price, while it is somewhat doubtful if its real value and usefulness would increase accordingly. Remembering therefore the mission for which it first saw light (*see page 143*), I propose to add instead another chapter entitled “Results of further experience, or the Amateur’s Orchid House” and another on the “Culture of *Odontoglossum crispum*,” which I hope may still further assist.

As various writers on orchids, and compilers of Catalogues, do not all agree as to the spelling of the names of some Orchids, I thought it best to be guided in this matter by some high authority, and have to thank Mr. R. A. Rolfe for his most valuable services in this respect, and for kindly reading the proofs.

H. A. BURBERRY.

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The blocks used for illustrating pages 77, 93, 97, 107, 117 and 123 are supplied by Messrs. Pitcher & Manda, New Jersey, U.S.A.

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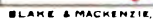
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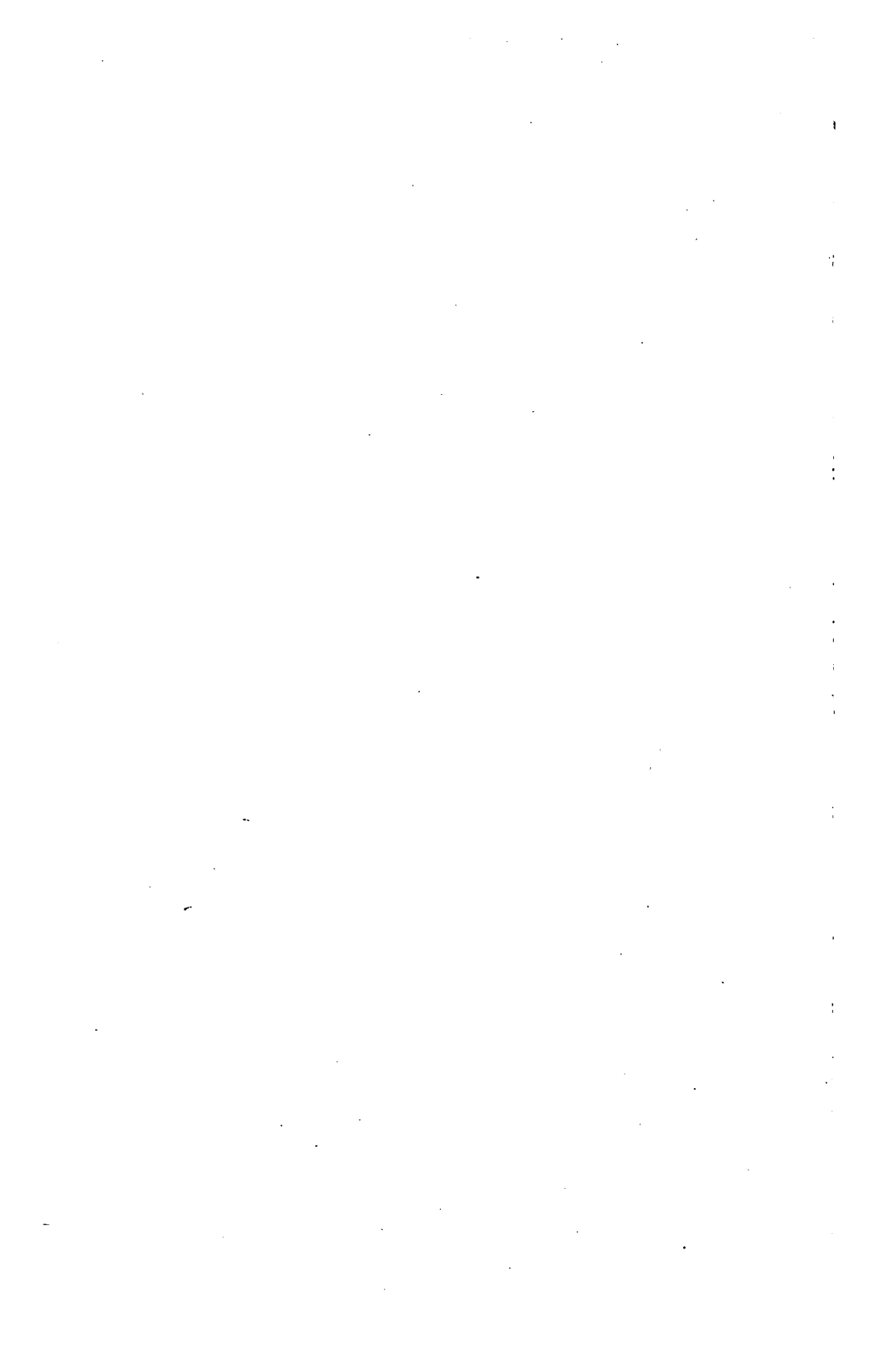
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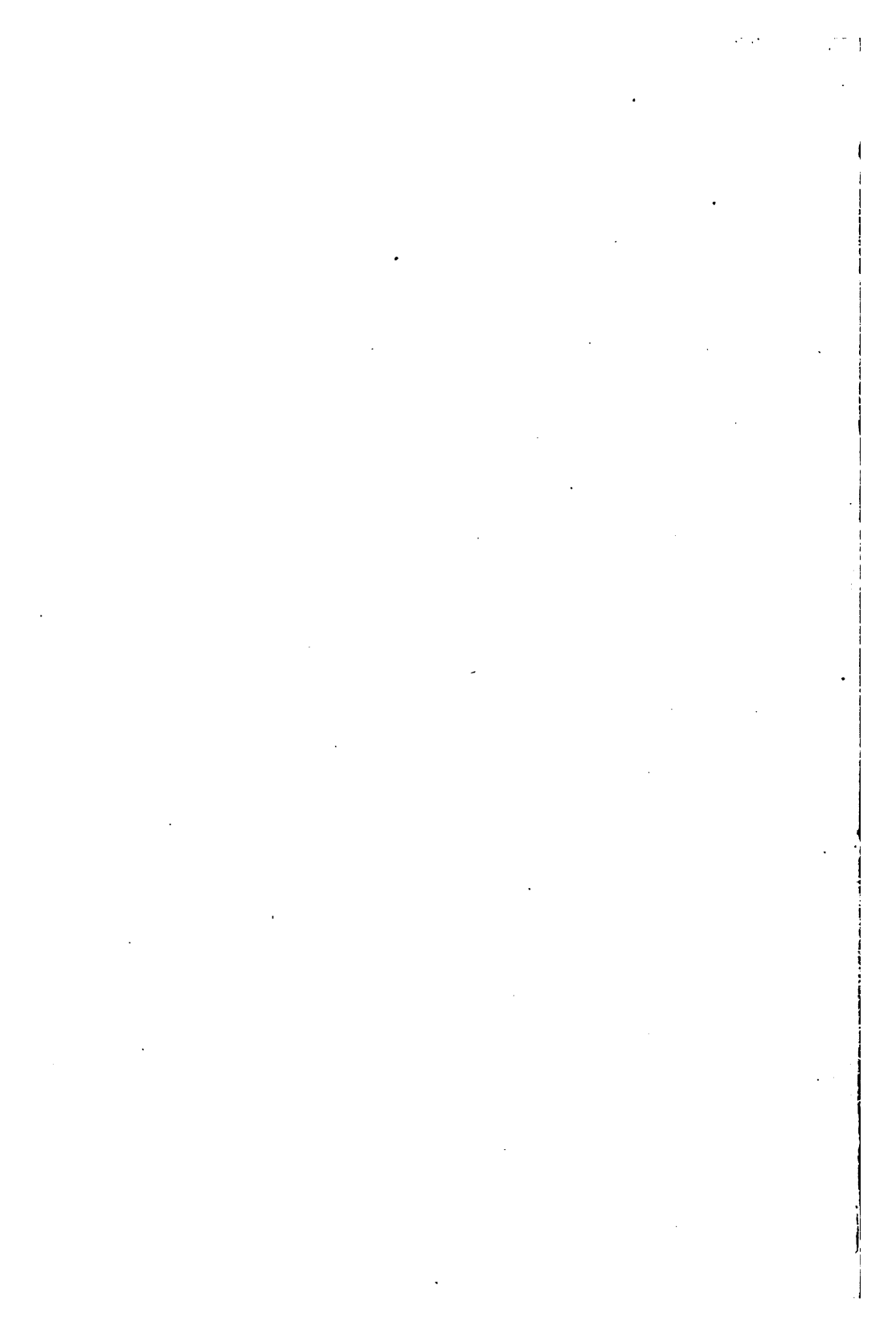
1—*Odontoglossum Cervantesii*. 2—*Odontoglossum Hallii*.
 3—*Odontoglossum crispum* (light variety). 4—*Odontoglossum crispum* (rosy variety).
 5—*Cymbidium eburneum*. 6—*Oncidium cheilophorum*.
 7—*Ada aurantiaca*. 8—*Cypripedium barbatum*. 9—*Sophranitis grandiflora*.



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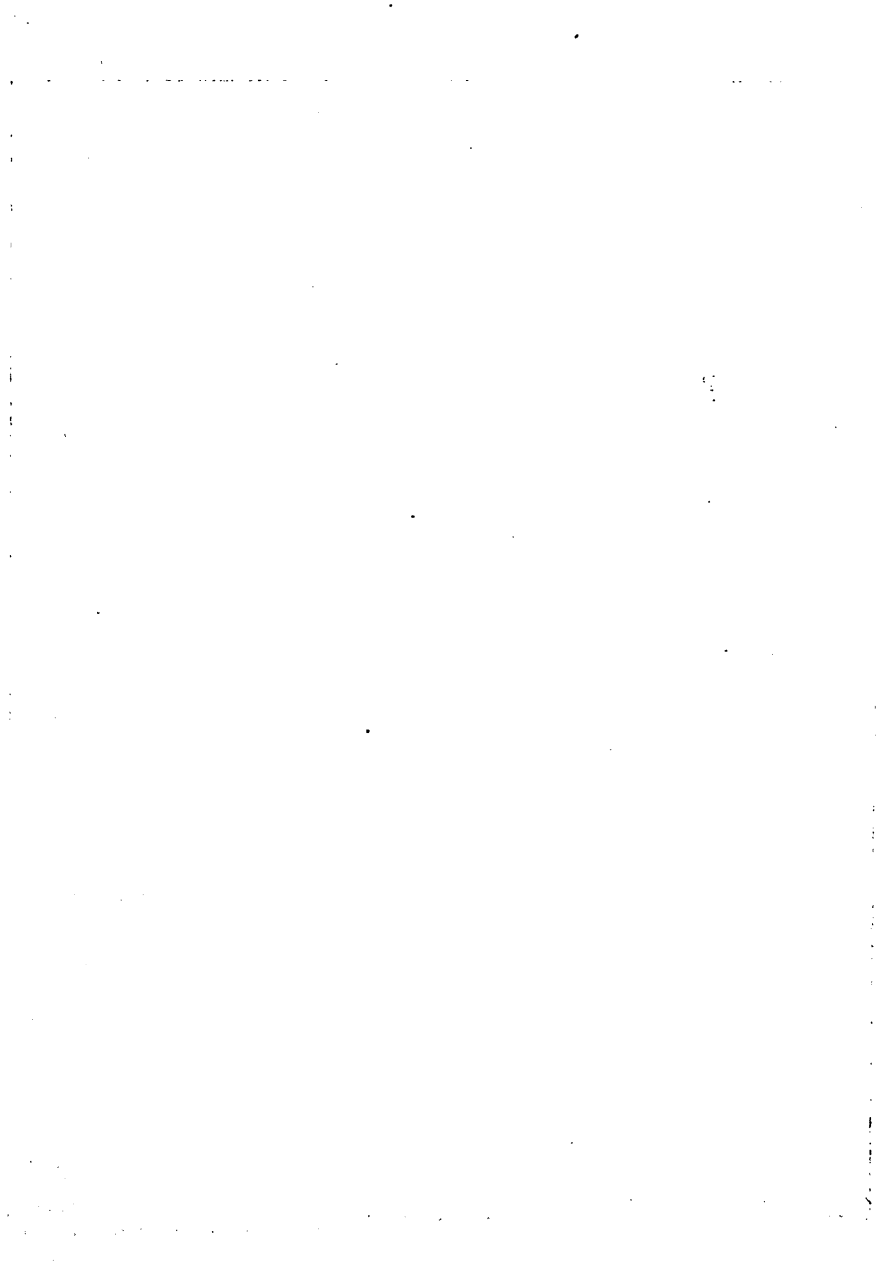


THE AMATEUR
ORCHID CULTIVATORS'
GUIDE BOOK.





CATTEYA HOUSE AT HIGHBURY, THE SEAT OF THE RIGHT HON. JOSEPH CHAMBERLAIN, M.P.





ORCHIDS:

HOW TO GROW THEM SUCCESSFULLY.

THE writer of this little manual having, for many years, devoted his attention to the study of Orchids and their cultivation, is desirous of imparting to others whose opportunities may have been less favourable, the results of a pretty wide and varied experience. In so doing, it will be his aim to dispel some erroneous impressions in regard to the subject which, if unrefuted, are calculated to diminish the popularity of a most lovely and interesting family of plants, as well as to deter many amateurs from attempting their cultivation. Such a circumstance would be much regretted, for a delightful recreation is unquestionably lost by those who love their gardens, and attend with pleasure to their greenhouse plants, if the aristocratic Orchid is not included in their collection; its beauty, if equalled, being but rarely surpassed by that of any other plant, so that, once the grower's interest is thoroughly awakened, he becomes so enamoured of his new hobby as to prefer it to all others, however interesting.

It is very important that it should be well understood how successfully Orchids may be grown, side by side, with other stove and greenhouse plants, such as I shall hereafter enumerate; and it is therefore quite unnecessary that the grower should devote his attention to the former alone, there being many greenhouse favourites, at once beautiful in flower and foliage, which he might easily select as fitting associates, and which, under similar treatment, would thrive equally well. Ferns, for instance, are particularly adapted for growing in the same house. Orchids cannot fail to be a source of the greatest pleasure to the cultivator, who soon finds himself deeply interested in the growth of his plants, irrespectively of their beautiful flowers, and watches with infinite satisfaction the development of the fine healthy foliage, the shooting of the tender roots as they appear at the base of the pseudobulbs and gradually take possession of the compost, or the young pseudobulb as it forms and matures.

Nineteen years' practical experience in Orchid growing has shown me that, when once their nature is thoroughly understood, much less attention than is generally thought necessary is requisite to grow them successfully, their requirements being so simple as to encroach less than what is thought upon the grower's time. It is quite true that some species still baffle the most experienced cultivators, owing, no doubt, to an imperfect knowledge of the climatic and natural conditions they enjoy in their native habitat; but, as these varieties are somewhat difficult to grow, I shall not recommend them to the amateur's consideration until he has gained more experience; for, as a rule, such sorts are less beautiful than others of easy growth, and can therefore be dispensed with. When the necessary culture of a genus or species becomes generally known, the ease and simplicity of its cultivation are speedily made manifest to the inexperienced amateur, thus leading to its more extended culture and that better appreciation which it so richly deserves. I am anxious, both for the sake of our Orchids, as well as for the benefit of those who may wish to attempt their cultivation, to point out that there is absolutely no difficulty but what may easily be overcome, as soon as an ordinary knowledge of their requirements has been acquired. And, in order to assist amateurs, I shall do my best to give them such practical information as will materially aid them, provided the instructions I now write for their guidance are carefully perused and strictly followed.

Why are Orchids generally supposed to be an expensive luxury and out of the reach of all save the most wealthy? I think these notions have arisen from the fact that when Orchids are written about in newspapers and periodicals, they are invariably associated with the name of some well-known and wealthy individual as their possessor, which leads many persons to regard them as the exclusive property of a privileged few, and consequently invests them with such a degree of costliness as to make them entirely inaccessible to the humbler amateur. There are, I am pleased to be able to say, in answer to this, many collections of Orchids now in existence throughout the country, some of them very extensive, and containing rare and expensive sorts, owned by gentlemen with only a local reputation as business or public men; while a large number of amateurs, possessing only a greenhouse or two, are forming collections of a less pretentious character, commencing under good advice with easily cultivated sorts. This is most gratifying to Orchidists, and I venture to hope that this little guide book will induce many others to take up Orchids, as I feel confident that the great beauty of their flowers, as well as their lasting qualities, will amply repay any anxiety or trouble bestowed upon them.

Referring for a moment to a somewhat general impression that Orchids are difficult to manage, I must confess that there are some which are not easy to cultivate, or rather to maintain in a healthy

flowering condition for many years in succession; yet, there is nothing very extraordinary in this, as the same difficulty presents itself in regard to other plants. But it is not to those plants which are difficult to manage that I shall now devote attention, there being so large a field of species and varieties of easy culture to choose from. No one therefore need be disheartened if unsuccessful in the first attempt, merely because he may occasionally see some Orchids in a very unhealthy condition, even in gardens of considerable pretensions, where, owing to the gardener's want of knowledge of this particular class of plant, arising very often from no fault of his own, but from the fact that he has previously had no Orchids under his charge, and consequently no opportunity of studying their nature and requirements. In some cases, it may be the result of the gardener's insensibility to the necessity of obtaining information on the subject; under such circumstances failure must of necessity follow.

An impression also exists that Orchids are very expensive. This, however, applies only to very new or extremely rare kinds, many of which are not more beautiful than older sorts that are easily procurable at a moderate price—say a few shillings. It is the Orchid enthusiast who, wishing to add new introductions of supposed merit to his collection, seeks these new and rare kinds as introduced; and it is well that it should be so, otherwise many most valuable sorts would be very rarely seen. There is a very beautiful species of the popular genus *Odontoglossum*, named *O. crispum* (*syn.* *O. Alexandræ*), which deserves a prominent place in every collection of Cool Orchids, and which is purchaseable at a very small cost. And it often happens that amongst a quantity of plants of this kind, flowering in this country for the first time, some turn out to be of great value, in consequence of their being recognised as vastly improved varieties; whereas, others, showing no improvement on those already in existence, are, notwithstanding their attractions, classed among those of comparatively little value. I by no means advocate the buying and growing of Orchids as a pecuniary speculation, the enjoyment of their great loveliness being the only consideration; still, the fact remains that the selling value of an Orchid is fixed by the exceptional merit and beauty of its flowers, in size, colour, and form.

I have often heard gardeners, who do not understand the treatment of Orchids, declare, as an excuse for avoiding their culture, that these plants deteriorate. This is another erroneous impression which I should like to correct. There can be no manner of doubt that under unskilful and improper treatment Orchids lose vitality and often die, and this result follows with any other plant under similar conditions; but the same plant taken in hand, if not quite dead, and transferred to a proper temperature, where it is uniformly treated with all that is necessary to infuse life and vigour into it, will sometimes revive and

become healthy and strong. When Orchids are improperly treated, or placed in a temperature that does not suit them, they soon dwindle and assume a sickly appearance; but if their natural position in the country whence they came is thoroughly studied, and imitated as nearly as possible, then a gradual addition to their yearly growth is made, and successful culture ensured. And this success is sometimes attained in the near vicinity of smoky towns, and under further unfavourable circumstances tending against successful plant culture.

I have known persons, who professed to have a knowledge of Orchids, persistingly assert, despite all contradiction, that these plants bloom but once in several years; and it is to be regretted that such a wrong idea should prevail, for, under proper management, an established plant will bloom once a year, sometimes twice; that is, supposing the said plant is already of a flowering size; and if it be not so, it should not have been bought, as it causes delay and disappointment to the purchaser, who is naturally anxious to see it in flower. Amateurs should therefore secure strong flowering-sized plants to start with, even at a little more cost. Some commence forming a collection of Orchids without having any practical knowledge of their culture, trusting to their gardener's skill, who may possibly never have grown an Orchid, and consequently knows but little about it; thus failure upon failure ensues.

It would be far better, in every way, when forming a collection of Orchids, to secure the services of a suitable person with, at least, a moderate knowledge of the plants, who would be willing to improve that knowledge and seek for all the necessary information respecting their treatment. This should be done in the first instance—even if twice the wages of an incompetent man has to be paid in order to accomplish it—for the best kinds of Orchids grow in money value, as well as in size, quite independently of the great pleasure they afford; whereas, if improperly treated, they will probably disappear altogether. So many instances of miserable misadventure are met with, as the outcome of improper advice, that I have long felt that practical and reliable information at the beginning would lead to much more satisfactory results, hence the publication of this little Guide Book.

I purpose, in plain words, giving easily understood instructions on important points belonging to every-day work which have to be kept well in view. One important point to be considered being—what convenience already exists for growing these plants without building a house expressly for them; also, if the existing structure was intended either for a Warm, Intermediate, or as a Cool greenhouse; if in a light open position or a shaded one, and what heat can be relied upon in very cold weather. It will then be necessary to ascertain what Orchids are most suitable and likely to flourish there without giving much trouble, or demanding more attention than other plants which are well

grown. I will now endeavour to explain the difference in temperature of the Cool, the Intermediate, and the Warm house of a higher temperature, in order that learners may form an idea as to what class of Orchids are adapted for their houses, and to enable them the better to understand the growth and requirements of the plants under their care.

Formerly it was thought necessary, in order to cultivate Orchids, that some special structure should be built for them; but years of experience have proved that a disused vinery, or an ordinary greenhouse where a general collection of plants are grown, will suit Orchids equally well, provided they are properly attended to. Of course, as previously stated, it is necessary, before making a purchase, to consider to what different species of Orchids the house is best adapted; for instance, the degree of heat at command, and the amount of light or shade afforded, must be taken into account, and I will endeavour to explain this fully. I do not recommend the cultivation of Orchids with fruit trees in the same house, although it can be done, and sometimes successfully, by those who fully understand their requirements during the various stages of growth, but, unless in very experienced hands, such treatment would most probably end in failure, and I am desirous of bringing about an opposite state of affairs. Many of the most beautiful species of Cool and Intermediate Orchids will, as before remarked, grow with other plants, provided the conditions of the atmosphere and temperature are suitable. I am aware that many amateurs, especially those living in towns, labour under a difficulty, owing to the limited area of their glass structures which are sometimes placed in unfavourable positions, although some of these may be suitable for a restricted class of plants. It is not unusual to see a glass structure resembling (Fig. 1) a lean-to house

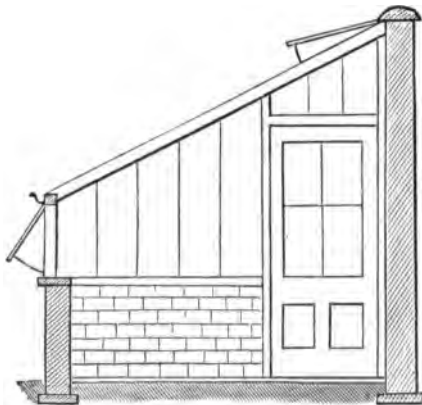


FIG. 1. LEAN-TO HOUSE.

against the dwelling-house or a garden wall, having an east or west aspect, and where Orchids, requiring the treatment of an Intermediate house, can be grown, as also many of the Stove (Warm-house) Orchids. If such a lean-to house has either a north, north-east, or north-west aspect, Cool Orchids will flourish; but it is not possible to grow Cool-house Orchids in a lean-to house facing the south, unless it be shaded from the sun by tall trees, but such an aspect would exactly suit either Intermediate or Warm Orchids. Should the house be a span-roofed one, as in Fig. 2, and standing in an open situation, then it could be made

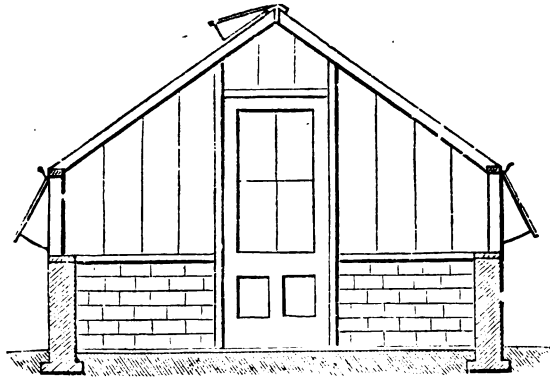


FIG. 2. SPAN-ROOFED HOUSE.

suitable for all species of Orchids, either Cool, Intermediate, or Warm-house, as well as those loving sunshine or thriving best in the shade. In such a house the atmosphere, temperature, and other conditions could be regulated as desired, by the aid of shading, ventilation, &c. If, on the other hand, this house should be naturally shaded by the growth of trees or tall buildings, it would be most suitable for Orchids loving shade, or partial shade, and require the use of roller blinds only when the sun acts directly upon the house. Having decided as to what plants the houses are best adapted, the next point will be how to buy the plants; and although this may, at first sight, appear to be an easy matter, it is nevertheless an important one, as success or disappointment depends very much upon the health and strength of the plant when purchased. Amateurs, therefore, should be very cautious in making their purchases, especially at first, for they are too often at the mercy of those who sell—some of whom are not over scrupulous in what they sell to beginners—so that those about to purchase will act wisely in consulting some experienced cultivator of Orchids, or, at all events, some person who understands them, and really knows



FIG. 3. CATTLEYA, AS IMPORTED.

whether a plant is healthy or not, and what its approximate value may be. Then the buyer has some chance of success with the plants selected to suit his greenhouse, and other conditions of culture, and he will naturally look forward to the pleasure they will afford him when in bloom.

But as such advice is not always within the reach of those who need it, I shall do my best to supply that want and make my meaning as clear as possible. There is one word of caution which I here desire to impress upon buyers, and that is, do not on any account buy rubbish merely for the sake of saying, "I grow Orchids!" and by no means be tempted to purchase small, insignificant plants simply because they are cheap. Orchids are rather slow growing plants, and if small and weakly bits of back pseudobulbs or weak spindling plants are bought, they require special care and attention, as well as the most judicious treatment, and much time is therefore lost before they can be got into a favourable condition and reach the flowering stage; so that the patience of the grower becomes exhausted, and the plants are either allowed to linger on or are thrown away. Overcrowding is another evil to be avoided, and when large quantities are grown in limited spaces, it is one of the greatest difficulties an Orchid cultivator has to contend with. Each plant should be accessible and easily seen by the cultivator at all times, but more especially during the growing season, in order that he may ascertain whether it requires water or is not overwatered, and to see that the young roots are unmolested or destroyed by various insect pests, such as wood lice, cockroaches, slugs, &c., and that the foliage is free from thrip or green or yellow fly. In a large collection, where plants are counted by the thousand, and a good staff of assistants are kept, it is, even then, difficult to give every plant necessary attention, so that the small grower has here an advantage in being able to give full attention to the few plants under his care.

CATTLEYAS AND LÆLIAS.

Presuming that Cattleyas, of such species as *labiata*, *Trianae*, *Mossiae*, and *Mendeli* in their varieties, also various others, are being purchased, good plants of these, with a leading growth, can readily be obtained at 4s. each, and with two leading growths at 7s. 6d. each, the price varying according to the strength of the plant and the excellence of the variety. I advise amateurs to start with such plants rather than those with a larger number of leading shoots, as they are more easily managed. Fig. 3 represents a newly imported plant showing the leading pseudobulb and the back pseudobulbs. The back bulbs, after flowering, are of no further use for blooming again, but serve as reservoirs for the plants by storing up nutriment during the growing or wet season for the use of

the plant during the dry season, so that the old pseudobulbs, apparently of no use to the inexperienced in Orchid culture, are still a part of the plant and continue for years to render assistance to it. I have, however, invariably found that under artificial cultivation they are of very little use after the fifth year, and when the plants are repotted they may be removed from their position, but not thrown away, for if there are any dormant eyes, they may push into other leading growths. In the case of *Oncidiums* or *Odontoglossums*, the old pseudobulbs should remain until they turn yellow and die. In buying plants of *Cattleyas*, the last fully-developed bulbs should be supported by at least three or four back ones, to give strength and nourishment to the new growth. I have quoted prices as a guide to beginners as to what class of plants to buy, these prices being generally considered to be fair to the buyer and seller; although, when a large importation of plants arrive in good condition, they may sometimes be purchased from the importer or at auction sales at a lower price.

DENDROBIUMS.

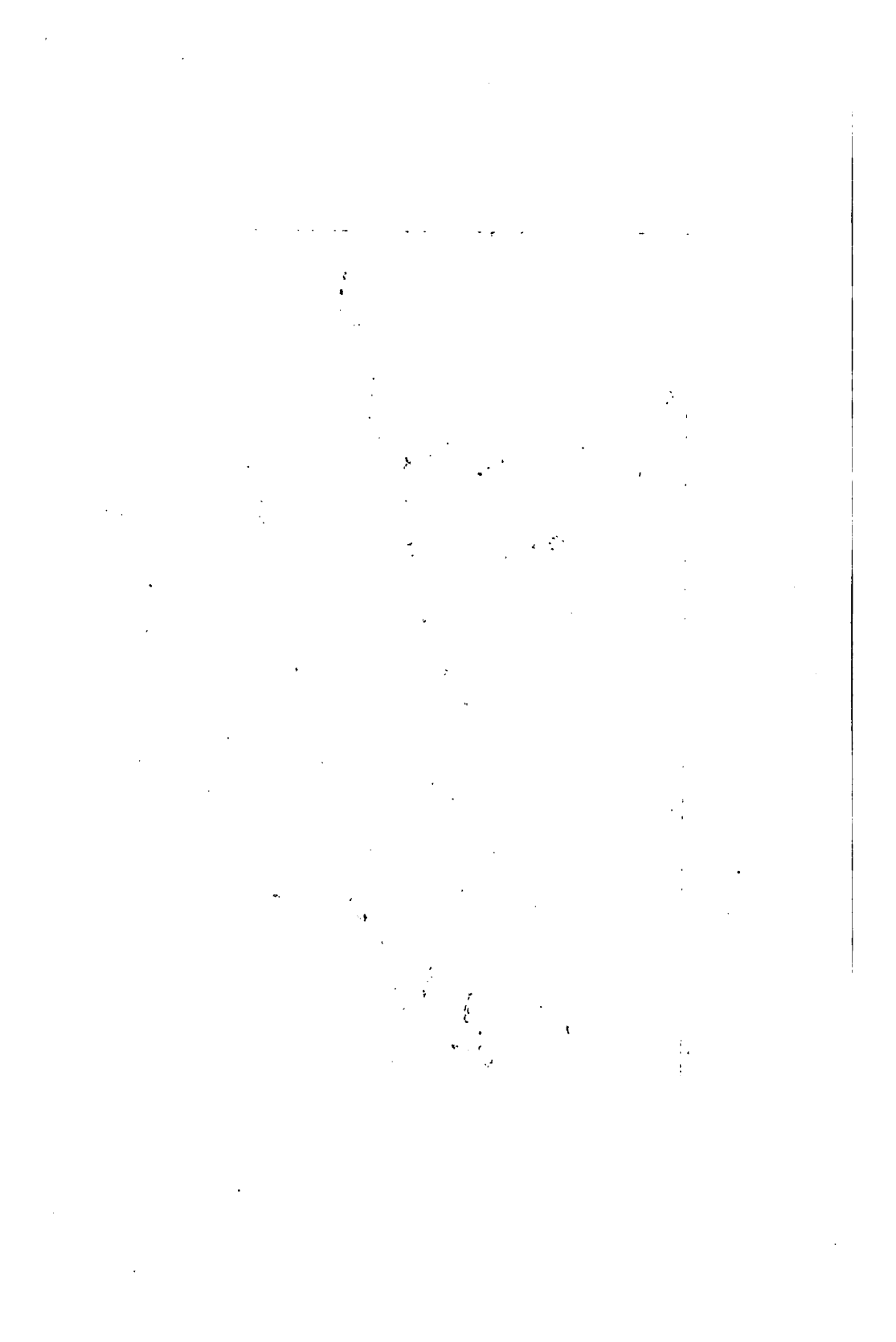
In buying such useful and beautiful species of *Dendrobiums* as *nobile*, *Wardianum*, and others, prices vary as in *Cattleyas*, and are ruled by the quantity of plants coming forward. *D. nobile* is one of the oldest species, and yet one of the very best and easiest grown. It is, however, advisable to buy established plants, as it is always cheap, and blooms are formed on the previous year's growth. It often happens that the old growths on imported plants become injured to some extent in transit, which prevents their flowering well, and two years will elapse before much bloom can be expected. Nearly all other *Dendrobiums*, which are not garden hybrids, may be purchased either newly imported or as established plants; but in the case of *D. Wardianum*, *D. crassinode*, *D. Devonianum*, and *D. formosum giganteum*, it is decidedly advantageous to buy strong newly imported or semi-established plants, carefully selecting those in a fine healthy condition. Fig. 5 represents an established plant in a 5-inch pot of *D. nobile* having four leads, 5s. being a fair value of such a plant. Fig. 6 represents an imported plant of *D. Wardianum* with two leads, and should be bought for 4s. In buying *Dendrobiums*, they should have two or three pseudobulbs disconnected at the rhizome in addition to the last made pseudobulb, counting as one leading growth. *Dendrobiums* do not really depend upon the old pseudobulbs from which to draw nourishment so much as some Orchids; they may therefore be cut away from the base of the plant, if it is advisable to propagate and increase the variety (*see Notes on Propagation, page 41*), leaving about four old pseudobulbs to support each forthcoming growth.



FIG. 5. DENDROBIUM NOBILE, ESTABLISHED.



FIG. 6. DENDROBIUM WARDIANUM, NEWLY IMPORTED.



ODONTOGLOSSUMS AND ONCIDIUMS.

These lovely and interesting genera of Orchids are general favourites, owing no doubt to the fact that, in addition to their beauty, the greater part of them can be grown successfully under cool treatment, and on that account are not so expensive to cultivate as those requiring more warmth. A large collection of these charming and useful Orchids could be got together, all of which would flourish under exactly the same conditions, and thus one house would, if properly managed, furnish the year round a good supply of the most lovely flowers imaginable. The great beauty and exceptionally meritorious character each individual species possesses, would fill volumes if full justice were done them. I propose to say but little in this direction, as it is a subject really of no aid to cultivation. In these days the general beauty and interesting character of Orchids are freely written about in various books and magazines, independently of the gardening press, but to read of the special qualities of a flower is one thing, and to grow that flower is another; therefore, I adhere chiefly to cultural directions, so that amateurs may be in a position to produce the flowers and see for themselves. Most of these cool growing *Odontoglossums* and *Oncidiums* are very cheap and exceedingly beautiful. *Odont. crispum* and *Odont. Pescatorei*, being two of the very best, should occupy a prominent position in every collection. These and other popular varieties may be purchased as strong imported or established plants; but by buying the latter in a healthy condition much time is gained, as the imported ones are slow in becoming established, and the others are purchaseable at almost any reasonable price; good plants of ordinary varieties selling at from 2s. 6d. to 3s. 6d. each, while as much as 50 guineas has sometimes been paid for a plant of an exceptionally fine or rare variety. It is best, therefore, to pay a reasonable price and start well with good plants. Fig. 7 represents an imported plant of *Odont. crispum*, a fair value being about 3s. to 5s. Fig. 8 represents a semi-established plant, obtainable at a cost of from 5s. to 7s. 6d. *Odont. crispum* (*syn.* *Odont. Alexandræ*), is a universal favourite, and is imported in very large numbers, finding a ready sale; but these, if strong and healthy, can seldom be purchased at lower prices than I have named.

CYPRIPEDIUMS (*The Lady's Slipper*).

These are Orchids having no pseudobulbs, and on that account are somewhat difficult to import and establish, but when successfully done they generally admit of easy culture. It is, however, best under all circumstances to procure established plants, and although very far from possessing the beauty and attractiveness of a *Cattleya* or a *Dendrobe*,

still there is a great deal of beauty in them all—some much more than in others—and all are most interesting and of comparatively easy culture. The most common, and one of the oldest and the freest growing of all, is *C. insigne*, still ranking as one of the best, good plants of which, in 5-inch pots, represented by Fig. 9, capable of bearing five or six flowers, can be purchased at from 5s. to 7s. 6d. There are many varieties of *C. insigne*, more or less expensive, according to the quality of the variety, but the typical form is handsome and can be grown so easily. Perhaps the most interesting and distinct form of *C. insigne* is to be found in *C. insigne*, *var. Sandersæ*, in which white and clear yellow colours predominate. (This was purchased by Baron Schröder for a large sum, and is now in several collections.) There are many other species and varieties of *Cypripediums*, nice plants of which may be secured at prices varying from 5s. to 20s., whilst other rare species and hybrids are more expensive. *Cypripediums* have now for several years held a prominent position and are established favourites; the diversity in colour of the various kinds, the interesting formation of their flowers, and their easy culture, having done so much to secure this popularity. It is quite easy by cross fertilisation to obtain seed which, in the majority of instances, will germinate, and in the hands of our hybridists, new forms, some of which are of great beauty and distinctness, are yearly being added to our collections. These, together with the different varieties of the many species, make up an extraordinary number of named sorts.

MASDEVALLIAS.

I now wish to say a few words about this very interesting genus of epiphytal Orchids. This genus was named in honour of Joseph Masdeval, a Spanish physician and botanist, and is a very large one, there being upwards of 150 known species. Comparatively few species, however, merit cultivation for their beauty alone, although all are extremely interesting; and in forming a collection of them many wonderfully quaint and curious forms and colours will be found, some of the tints being very peculiar. *Masdevallias* are Cool growing Orchids, and as many of them are of a very close, compact habit, they only require to be accommodated in small pans or in baskets suspended from the roof; therefore a large collection can be grown in a small space. A house which is in a sheltered position, both from strong winds and from the strong rays of the summer sun, suits them best, as then a moist and regular temperature and atmosphere can be evenly balanced, such as is congenial to this genus. They grow freely if potted in equal parts of sphagnum moss and peat, with a little coarse sand mixed in to keep the compost porous and sweet; for strong growing kinds a little fibrous loam may



FIG. 7. ODONTOGLOSSUM CRISPUM, AS IMPORTED.



FIG. 8. ODONTOGLOSSUM CRISPUM, SEMI-ESTABLISHED.



FIG. 9. CYPRIPIEDIUM INSIGNE.

be mixed in with advantage, and they should be given a position in the house not too far from the glass roof. *Masdevallias* under wrong treatment, such as over-indulgence in watering, being kept too dry, or when subjected to extreme heat or cold, refuse to make much headway—their leaves drop, the plant decays, and, having no pseudo-bulbs, they quickly disappear; but, on the other hand, they are very easily cultivated if the house and treatment suits them. Such species as *Harryana*, *Veitchiana*, and other similar strong growing kinds, are best grown in pots. The pots should be crocked for drainage to one-half their depth and the plants made moderately firm in the compost, as already indicated, using pots sufficiently large for the plants, and allowing an inch from the leading growth to the rim of the pot. In potting, the plants need not be elevated very high above the rim, or trouble may be experienced in making the plant secure, which must be done; otherwise, if left in a loose and unstable condition, the plants are unable to become quickly re-established and consequently dwindle. Small neat sticks should be used for this purpose, to keep the plants firmly in their places until they become self-supporting masses. The compost, after repotting, should be carefully watered, keeping it just moist only until the new roots appear and get hold of the compost, then more water may be given. Drought at the roots is not conducive to good growth, but it is safer to err on that side than to give too much water. The temperature really most suitable for a collection of *Masdevallias* is one a few degrees higher than that advised for the Cool *Odontoglossum* house during winter, but in summer as cool as possible.

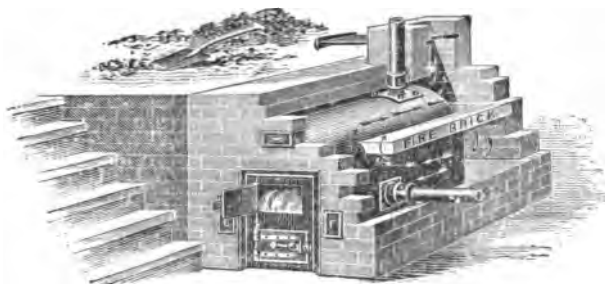
The species, *M. Harryana*, is named after Mr. Harry Veitch, the head of the great Chelsea firm of nurserymen, and the varieties of this species are very numerous and beautiful, and a great diversity of colour exists. There is in existence a pure white form, and the darkest colour known is the Bull's Blood variety, while *M. Harryana armeniaca* is a lovely orange colour; such varieties as these are very expensive, but the typical forms are very cheap.

The time of flowering for *Masdevallias* is generally from March to July, but a few are to be had in bloom the whole year round. Repot in February, or directly after flowering, about July.

ARTIFICIAL HEATING.

Heating by hot water is a most important matter, and, of course, the more perfect the arrangements the better can the desired degree of warmth be maintained. When this work is entrusted to a hot-water engineer, it is usually properly fitted and left in good working order; but it sometimes happens that when a house is to be used for a class of plants it was not originally built for, and there is a probability that there may be an insufficiency or a

superabundance of warmth, it becomes necessary to examine the heating power of the boiler and pipes in order to find out the defects in any part. Many kinds of boilers are in use; but whatever description of boiler may be decided upon, care should be taken that it is of sufficient size to heat whatever length of piping is attached to it, so that in hard wintry weather plenty of heat may be readily obtained to ensure a regular and perfect temperature without inducing strain or undue pressure upon the boiler.



BOILER IN POSITION.

Such a boiler as shown here is one that can always be relied upon. In the event of making any alteration in an existing house, or building new houses, it is well to have more hot-water pipes fixed than are actually sufficient, rather than not enough. For instance, a more genial growing temperature is generated from, say, four pipes made slightly warm, than from two pipes, which would probably have to be made very hot, and so give off dry, fiery heat. When there is more than one house heated from the same boiler, it is best to have sufficient valves, so that the hot water can be turned on to one house only, or to others also, as may be required. There are also a number of other boilers suitable for heating a small amount of piping, some of which

can be set into the brickwork of a wall or of the house, or on the ground level, thus saving the necessity of a stoke-hole. Some of these are very good.

For the Cool Orchid house there must be sufficient heat at command to maintain during severe weather a night temperature averaging 45 degrees. For an Intermediate house there should be enough to keep up a night temperature of 55 degrees; whilst the temperature of the Warm house should not be allowed to fall below 60 degrees for any length of time.

STOKING THE FIRES.

As it is warmth from the pipes which creates the artificial temperature in the greenhouse, and as Orchids are plants which sustain themselves chiefly on air, it is quite evident that the better the artificial air is produced and maintained the better it is for the Orchids, as well as for other plants growing with them. Stoking, then, is an important matter, and such work should be done by an intelligent man, and not left to any person unaccustomed to such work, as is too often the case. There is art even in stoking a greenhouse fire, and the person who is in charge of the fires should understand the thermometer, and be one who can be relied upon to give careful attention to his duties, letting the conditions of the weather outside guide him. Let us suppose, for instance, that it is a very dull and cold day in January, when the fires require to be well stoked, keeping them clear and bright, as can be done with anthracite coal or coke; at such a time more heat will be necessary during the day than at night, in order to give a rise of a few degrees in the temperature. This is an instance when careful stoking and watchfulness of the thermometer crops up. Then suppose a day in March or April, clear and bright, but very cold, necessitating good firing during the night to keep up a proper temperature, but with the sun shining brightly in the daytime, a much reduced amount of fire only would be wanted. The fire could then be "damped down" with slack (small coal) until two or three o'clock in the afternoon, when it should be started again, first clearing out the furnace bars and firehole. In the hot summer days of June to August it is possible that fires may be dispensed with, even in the Stove house, but still a cold day or night may come, when a little fire to warm the pipes and raise the temperature a few degrees would be advantageous. Again, in November, one day may be very cold, requiring brisk fires to keep the proper temperature, whereas the following day may be damp and close, needing but little warmth in the pipes, enough only to assist ventilation and to admit of the ventilators being opened. See, then, that the fire is managed carefully, always maintaining an even temperature, avoiding the extremes of overheating and dryness, or damp and cold.

VENTILATION.

This is another most important matter requiring the attention of some one having a fair amount of intelligence, for Orchids are plants that live, thrive and grow robust on the air and the moisture it contains, therefore it is absolutely necessary that they should have as much air as possible without causing a draught, or sudden rising or falling of the thermometer, as this would be injurious. Every plant house should have ventilators to open and close, both at the bottom and top of the building. Those at the bottom should be in the wall, on a level with the hot-water pipes, and the top ventilators should be at the highest point of the house; and the opening and closing of these ventilators require as much care as the stoking. The person in charge must be guided entirely by the condition of the weather, as two successive days at any season of the year may demand a difference in management. One summer day may be warm and the wind calm, and the houses shaded from the fierce rays of the sun, and the ventilators opened more or less on all sides in order to secure perfect ventilation; the following day it may still be bright, and necessary for the roller blind to be let down, with cold and drying wind blowing rather strongly from, say, the west, in which case the ventilators facing the west must be kept almost closed, perhaps quite so, whilst those on the east side can be opened as required. A well ventilated moist growing temperature could thus be secured, but not so if the ventilators were opened on the windward side, with a direct draught of cold arid air on the plants, which would cause them to suffer. A careful system of ventilation should therefore be observed at all periods of the year, but the autumn months admit of a greater amount of air and ventilation than at any other season, as it is at this period that many Orchids have finished their growth and require to be "harvested," as it were, by gradually reducing somewhat the amount of moisture both in the atmosphere and at the roots. To obtain this, the ventilators may be opened a little more freely; still, at the same time, discretion must be used in giving air, bearing in mind that when new growth is finished more air is necessary to consolidate such growth, also to benefit the old growth. Note, however, the outside degree of temperature and the direction of the wind, and act accordingly.

During the winter months air should be admitted at all times when the outside conditions of the atmosphere permit. But it often happens that it is necessary to shut the houses up as closely as is possible, especially in exposed situations, in order to keep the thermometer registering the desired degree of heat; but when it can be done, admit air through the bottom ventilators in a very small degree, increasing it if the weather becomes more favourable. In very mild weather the top ventilators may be opened, more or less, on the leeward side only;

but only rarely during the winter or spring should they be opened on the windward side.

The utmost attention to ventilation is required during the spring months, as the plants are then in a somewhat tender and delicate state, having passed through the winter, when, no matter how much care may have been exercised as to heat and ventilation, they are of necessity deprived of much air, having been kept in a close temperature, and are therefore more susceptible of a check at this season than at any other period. It is then we often get bright sunshine accompanied by a cold east wind, when it is a mistake to open the ventilators, as many do, to keep down the temperature. Instead of doing this let down the roller blind early, so that the temperature may not get too heated, and a little air through the crevices, which invariably exist, will be found sufficient.

Ventilation at night requires careful management—and it is always beneficial at night, when the outside condition permits, as well as during the day—in our uncertain climate, with the exception of the Cool Orchid house, which we can ventilate as freely at night as during the day.

In the Intermediate house in warm weather I frequently leave on a good deal of bottom air, and sometimes a little on the leeward side at top; and in warm weather a little bottom air in the Warm houses, but very rarely leave on top ventilation during the night, especially in the growing season. No hard and fast rule can be laid down, so much depends upon the cultivator's own judgment, for not only do the conditions of structures vary, but also the climatic conditions in various parts of the country, even when not far apart.

SHADING.

Shading the house at all times, when necessary, is another subject to which I must draw attention, as some Orchids do best in the shade, many prefer partial shade, whilst others, in their native state, luxuriate in the full blaze of the sun, but, when under glass, there are few plants that will withstand its full power during the summer months without some protection in the way of shading. But as most Orchids require as much light as can be given to them, exclusive of the scorching rays of the sun, it is best to use roller blinds that can be let down in sunny weather and rolled up during cloudy periods or when the heat of the day is past. One of the best systems of shading is that marked *D* and *E* on illustration of a model Orchid house. A framework of wood or iron is fixed upon the roof of the house, merely for the roller to rest upon. This framework should be about eight inches from the glass, so as to admit air and keep the house cooler than if the shading rested on the sash bars, an important point with Cool Orchids, especially during the summer. The blinds can be easily arranged to roll up and down,

by means of a cord and a simple apparatus, which any carpenter can fix. These roller blinds should be affixed by the end of February, so as to be ready for use when wanted, for it is frequently found that without such shading bright sunshine will do much damage early in the spring, even to plants which are able to stand the full blaze of the sun in summer, and that is brought about by the plant having passed through months of dull weather—perhaps with weeks almost sunless—and, being in consequence in a less hardy state than usual, are unable to bear a sudden burst of sunshine of a few hour's duration. If shading is neglected, the foliage gets burnt and damaged, checking growth and giving an unsightly appearance to the plants; it is therefore most important that after a long spell of dull weather the plants should be gradually accustomed to stronger light and sunshine. The roller blind system of shading is far better than colouring the glass with whitewash or other similar preparation, which keeps the house too dark in dull weather for the wellbeing of the plants, whilst, in bright weather, the temperature of the house is likely to get much too hot and dry, bringing on the propagation of various insect pests. The sides and ends of the house may be permanently shaded by colouring matter through the summer, but this should be washed off again in September.

Various materials may be used for blinds, but there is one manufactured for the purpose, which can be purchased of our leading nursery and seedsmen; this is made of various textures, the thicker material suitable for shading Cool-house Orchids, and the thinner for plants requiring less shading. The blinds should be taken down in the autumn—some of them may be dispensed with at the end of September—and, when quite dry, can be stowed away until the following spring.

Another system of shading, and perhaps for Orchids the best of all, is that shown in Fig. 10. This is made of strips of deal, a quarter of an inch thick and an inch wide, and as long as the depth of the roof of the house—they are made in about six feet lengths. Thus a house 18 feet long would require three lengths for one side, and, as these are so easily rolled up, all that is needed is to place them on the wooden framework above the glass, and rolling or unrolling them by the hand, or by cord and pulley, as necessary. They are made by tying the strips together with twine, leaving space between each strip of from a quarter of an inch. There is now a greatly improved method of making lath blinds by machinery (*see Walters & Co.'s advt.*)

THE ATMOSPHERE.

Attention having been given to Stoking, Heating, Ventilation, and Shading, as already advised, much has been done to create a suitable atmosphere for the plants to live upon. Amateurs will do well to see that it is not in any way stuffy or close, as stagnant air is as objectionable and injurious to plants as to human beings. Water is an

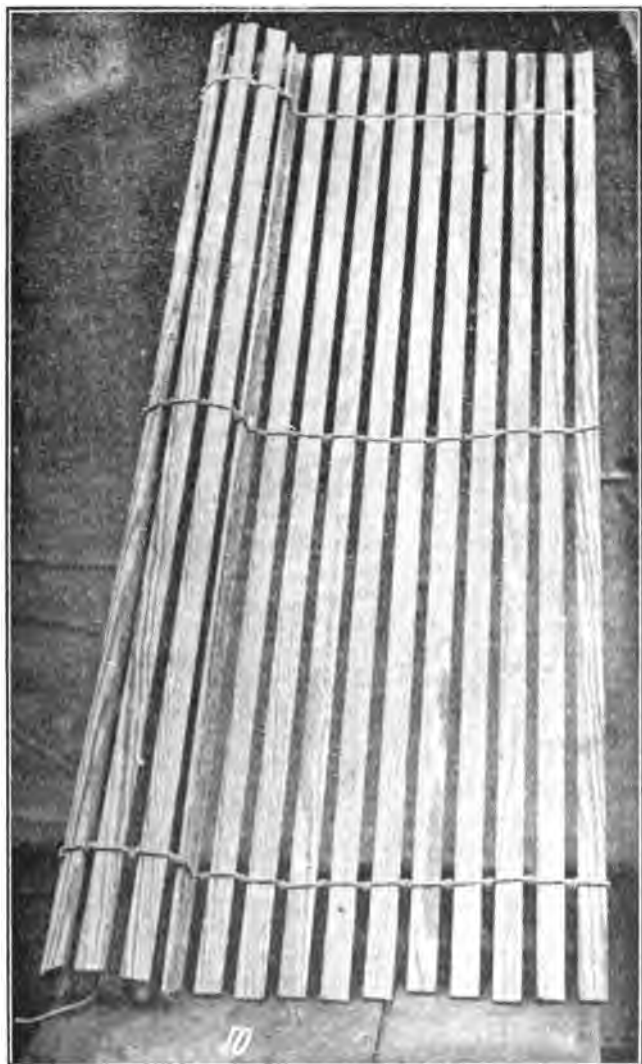


FIG. 10 LATH ROLLER BLIND.

indispensable factor in producing an atmosphere suitable for Orchids and other plants which grow in company with them, and a good supply should always be at hand. Hard, or tap water, will do for damping the stages, floors, and side walls, in order to produce evaporation; but, for watering the plants, rain water, reservoir, or river water should be used. The atmospheric conditions of the house, of course, varies according to the season of the year, and, whether the plants are in a growing state or at rest, there may be days which are wet and not very cold, when it would not be necessary for the pipes to give out much heat; then, what with the moist air entering the house and but little fire heat to dry it up, and with the plants in a dormant state, very little, if any, watering would be requisite on the floor, stages, or the plants. But on days when it may be very cold, necessitating a great amount of heat in the hot-water pipes, then, of course, sufficient water must be used on the floor for the prevention of a harsh and dry atmosphere, taking care to preserve a proper degree of genial temperature.

As a general rule, during the winter months, damping down the floors and stages once a day is quite sufficient, and that work should be done in the morning; but on some days it is not required at all. In the spring and summer months the atmosphere should be more humid than at any other season, as the plants are then making young growths, and it is at this time that a moist atmosphere is so essential to them to induce strong quick growth. A higher temperature is then also required in the Warm house, and more air being given, greater attention must be paid to the damping of floors, stages, &c. During the growing season it is advisable to thoroughly damp down between the pots, floors, and walks three times a day, especially in bright weather—morning, noon, and night. The arrival of autumn brings with it a reminder that the plants having made their season's growth less moisture is needed and may be partially, but gradually, withheld. The season of rest having arrived, it is advisable to encourage an atmosphere that is airy, light, drier, and bright, but not even then should the atmosphere be allowed to get too dry, and under such conditions the plants will be sustained in health during this period of rest without exciting premature growth; second growths late in the season being very undesirable, for rarely can such plants as *Cattleyas* and *Dendrobiums* finish off perfectly such growths, even in a long and fine summer. Evaporating troughs on the hot-water pipes are sometimes adopted to assist in generating moisture.

TEMPERATURE.

As with the atmosphere, so with the temperature of the house, success depends in a great measure upon the right or wrong degree. Even where proper arrangements have been made for ventilation,

shading, and stoking, there is frequently some difficulty in keeping the house exactly at a given degree of warmth. Slight variations are bound to occur. It is quite natural, for the inside temperature is affected by that prevailing outside, but extremes of heat or cold must be avoided. If the temperature of a house should by accident fall much below the necessary degree, do not force the fire at a rapid rate in order to immediately restore the heat, but when the weather is very cold cover the house with garden mats or other material, letting the fire start gently, and the temperature rise slowly to the proper degree. On the other hand, should the temperature, through neglect of ventilation or some other cause, rise to a height out of proportion to what is requisite, as it often will, most rapidly when shading and ventilation in hot weather is not properly seen to, then do not open the doors and ventilators widely, but at once run down the roller blinds and open the ventilators gradually, in order that the temperature may be brought down to the degree of heat required. Good management and care will however prevent such accidents, and a wise grower will not allow valuable plants to run the risk of injury from such a cause. It is no uncommon occurrence to see two healthy specimens of an Orchid, standing side by side, one wet at the roots, the other perfectly dry. The sudden and rapid fall in temperature would most likely injure the plant with wet surroundings, whilst that with its roots quite dry would suffer more from extreme heat, and yet the conditions of these plants at the time of injury may have been overlooked and some other reason assigned as the cause. Temperature and atmosphere must therefore go hand in hand, and with the judicious application of fire, or sun heat, with air and moisture, a suitable temperature for all seasons can easily be obtained. Just a word or two as to a general rule. Avoid an internal muggy atmosphere in close gloomy weather, and a fiery dry temperature in cold weather, or excessive heat or cold at all times.

I again refer to the subject of ventilation. No doubt, if properly used, air is a most valuable agent; it is worth while to make it a study, for successful culture is due upon the systematic admittance of pure air. I remember hearing that well-known Orchid enthusiast, the late Mr. Dominy, relate how well his Cattleyas grew at Exeter in a house so glazed as to enable him to pass the handle of a budding knife between the lap of each pane of glass. This would generally be too much for the plants to stand in snowy and wintry weather, but then Exeter is comparatively warm to some parts of England. Although the above system may not be good to adopt everywhere, yet it clearly sets forth that which is needful; the ways and means of procuring the same must necessarily be left very much to the judgment of the cultivator.

The following tables are intended as a guide to amateurs in securing the necessary temperature for Cool Orchids, Intermediate



1—*Odontoglossum* x *Andersonianum*. 2—*Odontoglossum* *Pescatorei*.
 3—*Odontoglossum* *Rossi majus*. 4—*Odontoglossum* *maculatum*. 5—*Oncidium* *Papilio*.
 6—*Masdevallia* *ignea*. 7—*Cattleya* *Mendelli* (a very rosy form).
 8—*Angræcum* *Sanderianum*. 9—*Laelia* *elnabarina*. 10—*Dendrobium* *Wardianum*.
 11—*Dendrobium* *luteolum*.



WINTER AND SPRING FLOWERING ORCHIDS
(SOME OF THE FLOWERS ARE MUCH REDUCED.)

Orchids, or Warm Orchids, the degrees given being an average desideratum, and a little variation either way will do no harm. In fact, it is scarcely possible to maintain regularly the higher figures, and, although the temperature given should be aimed at, the thermometer will, doubtless, often indicate in cold wintry weather five or more degrees below, but this will do no harm, provided it does not remain so for a long time.

COOL HOUSE.

| | Day with Sun. | Day without Sun. | Night. | Morning. |
|--------------|--------------------------------|------------------|----------|----------|
| Winter..... | 60 | 50 to 55 | 50 | 45 to 50 |
| Spring | 60 to 65 | 58 to 60 | 55 | 50 to 55 |
| Summer..... | { As low as } { possible. } | 60 to 65 | 55 to 60 | 55 to 58 |
| Autumn..... | 60 to 65 | 58 to 60 | 55 | 50 to 55 |

INTERMEDIATE HOUSE.

| | Day with Sun. | Day without Sun. | Night. | Morning. |
|--------------|---------------|------------------|----------|----------|
| Winter..... | 65 to 70 | 60 | 58 to 60 | 55 to 58 |
| Spring | 70 to 75 | 65 to 70 | 60 to 65 | 58 to 60 |
| Summer..... | 75 to 80 | 70 to 75 | 65 to 68 | 60 to 65 |
| Autumn | 70 to 75 | 65 to 70 | 60 to 65 | 58 to 60 |

WARM HOUSE.

| | Day with Sun. | Day without Sun. | Night. | Morning. |
|--------------|---------------|------------------|----------|----------|
| Winter..... | 70 to 75 | 65 to 70 | 60 to 65 | 60 |
| Spring | 80 to 85 | 70 to 75 | 65 to 70 | 65 |
| Summer..... | 85 to 90 | 75 to 80 | 75 | 70 to 75 |
| Autumn..... | 75 to 85 | 70 to 75 | 65 to 70 | 65 |

POTTING AND BASKETING.

It is not only essential that this work should be carefully done but that it should be performed at the right season. The compost in which to grow most Orchids is the very best fibrous Orchid peat and sphagnum moss in about equal proportions, adding a sprinkling of broken charcoal; the peat should be broken into pieces about the size

of a hen's egg by the fingers, and if the moss is long it should be chopped once or twice. This forms the best compost known for the majority of Orchids, although some species require more peat than sphagnum, and in some cases a little sweet fibrous loam may be added to advantage. Having prepared and mixed the compost, the plant, if an established one, should be turned out of the pot and all the crocks and old material cleaned away from the roots, bearing in mind that it is a very bad practice to insert the old ball of roots into a new pot, as is customary with other plants, such as ferns, &c. The removal of the old compost and crocks is best accomplished by means of a pointed stick; all dead roots, pseudobulbs, or old stems useless to the plant, having been carefully cut away, a clean pot or basket should be close at hand, and of the right size, to receive the plant. In repotting Orchids it is not always necessary to give them a larger pot, as one of the same size as that in which it has been grown often suits it better. It is a great mistake to overpot Orchids. A good idea of the size required can be gained by selecting one large enough for the plant when two more growths are added to the leading pseudobulbs before reaching the side of the pot. The roots of Orchids should not be unduly disturbed, provided the plants have been recently potted and in good material, as many may remain two, or even three years, without disturbance, needing only top dressings and the renewal of supporting sticks. When, however, repotting is necessary, and that is when the compost becomes too much decayed and in a sour condition, or the leading pseudobulbs are growing over the rim of the pot, or from any other cause, then the repotting should be done carefully and well.

POTTING CATTLEYAS.

Supposing, for instance, we are about to repot Cattleyas. In the first place, take the plant out of the old pot as carefully as possible, clearing away all worn out soil, &c., as already directed; avoid, if possible, breaking any roots, and have a clean pot ready, about half full of clean broken crocks and small lumps of charcoal, to form effective drainage, so that water can pass through most freely and escape through the hole at the bottom of the pot. A thin layer of sphagnum should be laid over the crocks and charcoal, then place the plant in position, holding it there with one hand and with the other distributing the roots in the pot, afterwards filling in with the compost, and whilst still holding the plant firmly with one hand, the peat, sphagnum, &c., should be carefully packed in, neither too firmly or too loosely, but well into the centre between the roots so that no hollow spaces are left. A little practice and careful use of the fingers will soon enable beginners to pot their plants properly. The plant will then be self-supporting, with the exception perhaps of a few neat sticks



FIG. II. CATTLEYA, NEWLY POTTED.

thrust into the compost gently, so as not to injure any roots but yet support the plant securely, and prevent injury to the pseudobulbs and young growth. As soon as the plant is made secure by the support of sticks, then carefully finish off the potting, by filling up any holes or loose places, leaving an even regular surface, with the centre of the plant a little raised and tapering off to the rim of the pot, bearing in mind that the compost should rise well up to the base of the pseudobulbs, especially the leading ones. Newly forming roots will then push out direct into the fresh compost, and having grown safely into the moss they are out of the way of their enemies, the slugs and other pests, which are very partial to the young and tender points. In repotting, the opportunity should be embraced of forming a neat and well shaped plant; and if ill shaped, it should be cut in two and re-arranged into a better form, with the growths pointing towards the centre.

Fig. 11 represents a newly potted plant of *Cattleya*, showing position of drainage and compost.

ODONTOGLOSSUMS AND ONCIDIUMS.

The mode of potting these is very similar to that already described for *Cattleyas*, as to drainage, compost, and other items, although *Odontoglossums* and *Oncidiums* are not quite so sensitive as to the fibrous nature of peat; therefore the best, and that which is of the most fibrous texture, should be selected for the *Cattleyas*. Neither should over large pots be used for *Odontoglossums*, as they become re-established much quicker and are more readily managed in comparatively small pots. I do not, of course, recommend cramming the plants in so that they are in a cramped state to commence with and have not sufficient room to grow. What I mean is, that the old pseudobulbs should be placed close together, filling in between them with compost to the base, allowing a margin between the leading pseudobulbs and the rim of the pot sufficient for the development of the next two years' growth; that is, two new bulbs before the side is reached. These should also be made firm in their pots by the use of small sticks.

CYPRIPEDIUMS.

These plants very soon recover from any disturbance of the roots, and are very free growing. They require a compost with a little more body in it, and of a richer nature than that previously recommended for *Odontoglossums*; it should consist of equal parts lumpy peat, not of such a fibrous nature as for *Cattleyas*, adding sphagnum and a fourth part of fibrous loam broken into small pieces. This, with a liberal addition of coarse silver or river sand, should be well mixed together. The pots should be crocked, as recommended for *Cattleyas*,

with a thin layer of sphagnum over the drainage. All the old soil, &c., must be removed from the roots, the plants held in position and filled in between the roots, as before advised for *Cattleyas*, taking care not to injure the roots, or packing too hard or too loosely; it is advisable to have the plant just above the rim of the pot. *Cypripediums* grow rather luxuriantly, and should therefore have reasonably large pots in proportion to the size of the plants and the quantity of roots.

DENDROBIUMS.

These must be potted in the very best fibrous peat and sphagnum, in equal proportions, preparing both as recommended for *Cattleyas*, and the pots should be thoroughly drained in the same way. As a rule, *Dendrobiums* do far better in small pots than large ones; in fact, some kinds are most sensitive in this respect, a large mass of material about the roots being most distasteful to them. Many of the *Dendrobiums* really thrive better when planted in teakwood baskets or earthen pans and suspended from the roof; still there are some kinds which it is necessary to grow in pots, because of the great length of their pseudobulbs. Fig. 12 illustrates the method of growing them in baskets or pans. There are, however, exceptions, as in *D. Falconeri*, one of the most beautiful of all, and a comparatively fragile grower. This variety is most successfully cultivated on a teakwood raft, or, what is still better, a portion of the stem of a tree fern. *D. aggregatum majus* must also be grown on a block.

TIME OF REPOTTING.

The proper time for carrying out this work can scarcely be disregarded, and it should be made a practice to do all that is required in this respect immediately after their season of flowering, for it is then that Orchids commence growing and pushing new roots, which readily take hold of the new soil. There are, however, a few exceptions to this rule, and these are the autumn-flowering species, such as some of the *Oncidium*s, *Vandas*, *Odontoglossums*, *Pleiones*, and *Thunias*, which should not be disturbed until repotted in the spring. *Cattleya Warscewiczii* (*syn. gigas*), *aurea*, and *Warneri* are also late summer and autumn-flowering kinds, but these I prefer repotting directly after they have flowered, although they may be left until the early spring, when this operation can be performed with success. *Cattleya labiata* (*syn. Waroqueeana*), *Boweringiana*, and *Lælia pumila* also flower late in the autumn, and, like all other late-flowering sorts, are best left over until spring, as during the dark days of winter but little root action takes place, and it is far better to leave the repotting until young roots are ready to start into the new compost. It is best to attend to the Cool-house *Odontoglossums* as they go out of flower and directly the new growth is seen pushing from the base of the last made pseudobulbs.

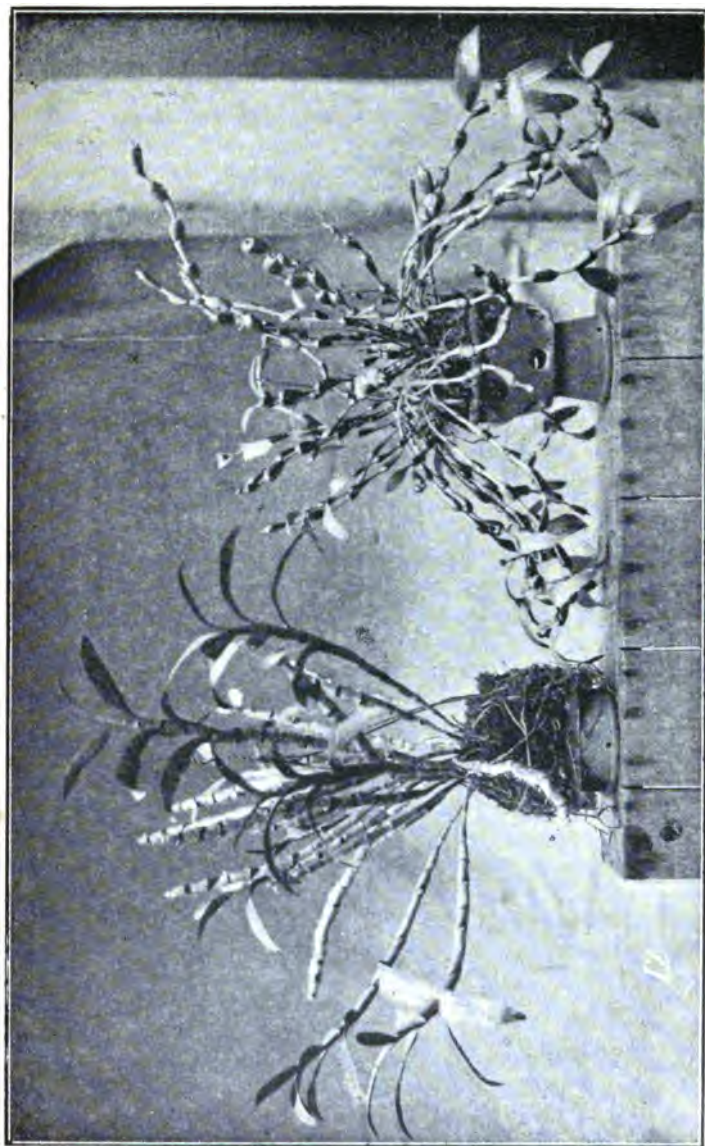


FIG. 12. DENDROBIUMS, SHOWING PAN AND BASKET CULTURE.



POTS AND BASKETS VERSUS BLOCKS.

Do not be persuaded to attempt growing Orchids on blocks of wood, thinking that by so doing their natural habit will be more closely imitated, for it invariably ends in failure, and there are but few exceptions to this rule. They cannot in our artificially heated glass houses be grown successfully for any length of time on blocks of wood or lumps of stone, as they are known to do in their native habitats, where they flourish in full vigour and beauty. This may appear to be a strange dogma to the inexperienced in growing Orchids, but it is nevertheless a fact. I grant that a newly imported healthy plant of *Cattleya* or *Dendrobium*, if wired to a block of wood or cork, will grow well for a year, or perhaps two, but after that the plant is found to dwindle away and become less by degrees. The reason why Orchids fail with us, when trying to grow them in the manner in which they luxuriate in their native countries, is obvious, when we take into consideration how utterly impossible it is for us, even in the largest and most perfectly regulated establishments, to create in an enclosed space of a few square yards, which has to be heated artificially for more or less of nine months of the year, that admirable, fresh, buoyant, and uniform atmosphere which exists amongst their native mountains and in their forests and dells. We may sometimes, during favourable weather and proper management, partly succeed in doing this, but perhaps in the next hour, with lax attention and a totally different temperature, there will be a greatly altered state of affairs. This varying and ever changing artificial atmosphere—sometimes laden with moisture, at others dry and harsh, with the temperature changing quickly from hot to cold—undoubtedly occurs in a larger or smaller degree in every establishment, and this is the chief reason why an Orchid does not grow satisfactorily if all its roots are exposed to these sudden and recurring changeable conditions, although it is natural for them to perform their proper functions when exposed in their native habitats. It is, therefore, necessary, when under culture, that the roots should have protection from these sudden changes of temperature, and this is best done by growing them in pots or baskets, in a suitable compost, as they thus escape the ill effects of root exposure and can be kept in a more regular condition of moisture, not saturated one day and extremely dry the next, as is the case when they are fastened to blocks of wood. There is also another reason, which I have no doubt has much to do with this failure on blocks, which is, that with us the blocks of wood have no life in them and contain no moisture whatever, whilst in their native countries many of the Orchids grow on living trees. I think it is a very rare experience with collectors abroad to find them growing and in good health on trees which have been dead any considerable time.

There is a beautiful old Orchid, *Cattleya citrina*, which from its peculiar drooping habit of growth cannot well be grown in any way but on blocks. Even if planted in a basket or pan in an upright position, the new growth will invariably turn downwards and creep over the sides. Some cultivators place these plants in small pans or baskets, making them firm with peat and sphagnum moss, so as to allow them full freedom of growth over the sides, and I have no doubt they last longer in a good healthy condition this way than any other, although it lasts for a considerable time in health on a block when well attended to. It is sometimes interesting to show visitors a plant growing on wood, and this *Cattleya* is the one I recommend to be grown for the purpose, but the block should be cut in a green state and of the desired length, leaving the bark for the roots to cling to. The wood of the pear tree, apple tree, or of the dogwood (*Cornus*) is the best; I remember once placing some plants of *Oncidium Papilio* (the Butterfly Orchid) on a block of dogwood, cut from a growing tree, sufficiently long for one end to be fixed firmly in a flower pot in an upright position, with crocks and sphagnum moss about it. The plants were placed close together on the top part of the block, completely away from the sphagnum, and the moisture from the latter kept the block quite green for a considerable time; during the first year it made a new layer of bark, and I never saw plants of *Oncidium Papilio* grow better under any conditions, the new bulbs and leaves were so strong, and the roots climbed down the block in great profusion. This plant, however, is best grown in small pans, being more secure and giving much less trouble.

TREATMENT OF IMPORTED ORCHIDS.

Imported plants require most careful treatment on their arrival from abroad, as a large number are severely injured at the commencement, and in many instances killed outright. The experienced Orchid cultivator, however, knows what is required to get them into a strong healthy state of growth, but in the hands of the inexperienced they dwindle and perish for want of proper treatment. It is sometimes the case that the plants have stood the journey well, and when unpacked look quite green and fresh, having scarcely lost a leaf. But if these were unpacked and suddenly exposed to strong light and moisture, many, if not all, of the green leaves would probably turn yellow or fall off with but very little warning, and of course greatly weaken the plants. Those who import Orchids for almost immediate sale by auction are naturally anxious that the plants should look well and fresh in the salerooms, and at as early a period as possible, and to obtain this result the plants are placed in a moist, darkened house, and frequently no attempt is made to really harden them off. It is necessary, therefore, for amateurs to be on their guard

and very careful with newly imported plants, getting them gradually accustomed to heat, light, and moisture, for if this is done too rapidly, and too liberally, the foliage may drop off considerably, and perhaps the pseudobulbs decay.

When the plants are received, all useless decaying foliage, roots, &c., should be removed carefully; and this done, the plants should be placed in a shady part of the Cool house, on the stage, and kept free from water and in an upright position, the moisture of the house being sufficient for one or two days. The foliage and pseudobulbs will soon commence swelling and become plump, and occasional waterings may then be given to the roots. As soon as the new growth or roots appear, the imported plants may be potted or placed in baskets or pans and then treated as established plants, watering them carefully as required. Some growers suspend the newly imported plants by the roots with the growth downwards, in the shade of the house, in order that no water shall lodge about them, receiving only the moist atmosphere of the house; but I am not in favour of this plan, and prefer placing them in an upright position from the first, as I have already explained. Experience has shown me that when suspended the imported plants do not so readily resume their normal functions of growth, the delay being much less when placed in an upright position. Should they, however, belong to the *Cattleya* or Warm-house section, they may be removed there after being a few days in a more shaded house. When potting or placing them in baskets advantage should be taken of this opportunity to form well shaped, compact plants, as frequently the imported plants, as taken from the branches of trees or when growing, are spreading and ill formed. In potting these it is sometimes necessary to part the mass and again replace the parts together, in order that the leading growth may take its proper position, and this can be done without the slightest injury at this stage, and a well shaped plant will be secured.

In potting the plants it is a great mistake to leave a mass of the old roots on them, as these, when confined in the pots, soon decay and become an inert mass of decomposed soddened matter, which is most objectionable and injurious to the new roots that will be formed. These old dead roots should be severely dealt with, and all taken clean away to the pseudobulb, as also all dead leaves or bulbs. With *Odontoglossums* and *Dendrobiums* a few of their old roots, cut back to two or three inches long, may be left on the plant, being useful in helping to keep the plants in position when potting them.

PROPAGATION.

Propagation of Orchids, or speaking more correctly of some kinds of Orchids, is slow indeed, and often unnecessary, as healthy and vigorous plants that will flower the first year may be bought at a very low

price; yet it is sometimes desirable to increase the stock of a very rare and expensive sort, or even an exceptionally good variety of a common species, in fact any other kind one may value and wish to propagate. Such free growing kinds as the *Calanthes*, *Pleiones*, *Cypripediums*, *Thunias*, *Masdevallias*, *Oncidium*s, and *Odontoglossum*s, when in a vigorous condition, readily increase in the number of leading growths without artificial aid, and if more stock is required it is easily obtained by dividing the plants. *Cattleyas*, *Laelias*, and *Dendrobium*s may also be increased by division, and this can be hastened somewhat by the use of a knife. Fig. 13 shows one method whereby a *Cattleya* or a *Laelia* can be made to break back through severing the rhizome, as shown in the illustration, but the resulting growths are generally weak, and several years elapse before they are strong enough to bloom. *Cattleyas* and *Laelias* sometimes have double breaks, forming two new pseudobulbs from an old one, but it frequently happens that, in the following year, one only of these new growths will take the lead and the other remain dormant, and if left undisturbed will often remain in this state for several years. When it is seen that both the new pseudobulbs are not going to start into growth at the same time, the weaker of the two should be severed from the parent plant close to the pseudobulb, and it will then be obliged to start into growth on its own account. The incision should be made with a sharp knife, care being taken not to cut the roots or injure any other part of the plant. The severed portion will then make a new pseudobulb the same year, provided the operation was performed in the spring, and in the following spring they will grow faster and surer if taken away from the parent plant and potted into small pots or baskets.

The propagation of the *Dendrobium* is easy, but is not practised so much as would be the case if many of the most beautiful varieties were not imported in such large quantities, strong plants being obtainable at such low prices as to render propagation unnecessary, unless in the case of an extraordinary good variety or a garden hybrid. When it is desired that young stock should be raised of *Dendrobium*s, the old pseudobulbs, which it is found may be cut away without injury to the plants, should be cut in three or four pieces and laid upon sphagnum moss, placed on a shelf or some other suitable place and kept moist, and in due time the young growths will appear, and these will form healthy young bulbs.

INSECT LIFE, CLEANLINESS, AND REMEDIES.

Cleanliness is a great point in the cultivation of Orchids, as well as with other plants, such as the removal of all rubbish from under the stages or elsewhere. Whitewashing the walls once a year, scrubbing the stages and pots occasionally, cleaning and sponging the leaves of the plants, all helping to keep down insect life, which, if unchecked,



FIG. 13. LÆLIA, SHOWING METHOD OF PROPAGATION.

soon becomes very troublesome. There are numerous kinds of insects which are enemies to the plants, and for the well being of the latter it is essential that all these pests should be kept in check. A camel's hair brush and a piece of sponge used by careful hands, and with clear soft water, are the best and most effective tools with which to clean away insect life from the plants. Insecticides, whether home made or otherwise, are always more or less dangerous, and often lead to the rotting away of the young growths of some of the more tender plants, such as *Chysis*, *Stanhopeas*, *Dendrobiums* and *Phaius*.

TOBACCO WATER can be made by well soaking a half pound of common twist tobacco in hot water, adding a half pound of soft soap, which is sufficient for four gallons of water, and makes a capital solution, which is both safe to use and effective, and into which the plant may be dipped for a few seconds when affected by thrip or aphid, taking care that the water is of the same temperature as the house. If the solution is very strong it will be safest to dip the plant into clean water after the lapse of a few minutes, but if of the proper strength the solution may be allowed to dry on it. The danger to be avoided is the lodging of any portion in the young and tender growths, which easily rot from this cause, therefore it is best to be cautious and well dry the liquid out of the hearts of the young growth with a camel's hair brush.

There are many chemical compounds made and freely advertised for the destruction of insect enemies to plant life, all of which may be good in their way, if used carefully according to the directions accompanying each, and are not injurious to plants.

FUMIGATION is of great assistance in the prevention of insect life, and it can be applied without injury to either foliage or flowers, when used in the form of "Campbell's Fumigating Insecticide" or "Richardson's XL All Fumigating Insecticide." It is safest to fumigate under rather than over the directions issued, especially for *Odontoglossums*. When it is desirable to fumigate choose a calm evening for the operation—the atmosphere should not be over dry nor should the foliage be at all wet.

SYRINGING.—The indiscriminate use of the syringe as a check to the spread of insects is not a good practice, either with clear water or water mixed with any insecticide, being ineffective and frequently the reverse of satisfactory.

SCALE, which clings so tenaciously to the leaves of *Saccolabiums*, *Aerides*, and *Cœlogyne cristata* in particular, is a great pest, and where it exists in large numbers, it is a good plan to make up a "lather" of yellow soap, and paint the leaves with it, allowing it to remain five minutes, afterwards washing it off with a sponge and clear water, when, should the scale still cling to the leaves, a little rubbing will remove it. There is a species of scale which infests *Cattleyas* and

Laelias, especially if the plants are not strong and healthy, which can be cleaned away periodically in the same manner, taking care, however, that the "lather" or insecticide does not get down to the roots, and this is easily prevented by holding a piece of sponge round the base of the pseudobulb until the operation is completed. Do not attempt to get them off with a sharp pointed stick, as this is both a dangerous and tedious method. "Murray's Electric Insecticide" is the best thing I have tried for ridding the *Cattleyas* of this pest; it should be used in the proportion of one part insecticide to four of rain water. Apply it over the insect by means of a small brush of stiffer fibre than camel's hair, thoroughly soaking the scale, and letting it remain until the insect is completely killed—it need not be washed off. The person who introduced this electric insecticide recommends the solution for syringing over the plants for the destruction of red spider, aphids, &c., but I think it best for amateurs to use rather less than is mentioned in the directions, as the young tender foliage of Orchids, as well as other plants, is very easily injured and growth consequently retarded. This applies equally to other insecticides.

TOBACCO POWDER is a valuable agent for the prevention of thrip and aphids, and should always be at hand. The disagreeable odours arising from fumigating or the use of insecticides are always more or less objectionable, and this annoyance may be avoided by using tobacco powder, which can be purchased from any seedsman, in 1s. or larger tins, and if a little of this is sprinkled into the young growths of the plant no thrips will go near them, whilst those that are there will be speedily destroyed.

COCKROACHES are terrible night depredators, and the best remedy I know for their destruction is the well known "Chase's Beetle Poison," which should be used at regular intervals in places where they are most likely to congregate or on any plants on which they have been feeding, taking special precautions to prevent their ravages on the young flower spikes and the tender tips of the roots.

WOODLICE also eat the roots, and should be trapped and killed. Various traps are employed for catching these pests, but the best of all, I find, is a potato cut in halves, with a portion of each half scooped out of the centre and then placed with the outside of the potato upwards, examining it every morning.

SLUGS.—These are also a great nuisance in the Orchid house, and have a special liking for the young and tender flower spikes. Lettuce leaves can be kept about the plants, and a little fresh bran in small saucers has a great attraction for them, and they should also be diligently searched for at night, using a lamp for their detection.

CATTLEYA FLY (*Isosoma orchidæurum*).—This is a much dreaded insect, and its larvæ is deposited in the centre of the young growth. Its existence there may be detected when the young break or growth is

about an inch high, as it becomes abnormally thick at the base and tapers somewhat more to a point than is usual, the growth making but little progress. The only method of exterminating this pest is to cut out the infested growth, in the centre of which the young grub will be found in a more or less advanced stage. If destroyed in this way an effectual stop to their breeding is attained and much harm to the plants prevented; but, should an infested growth be overlooked and the insect come to maturity, a great amount of damage may be done for another year. Luckily this insect is not very general, but it is always best to be on the alert when buying plants.

THE DENDROBIUM BEETLE (*Xyleborus perforans*) is of small size, but quite large enough to be capable of a great amount of mischief if not promptly checked, and should it get a foothold on the bulbs, as it often does in the Dendrobiums from the Torres Straits, such as *D. Phalænopsis*, *D. P. Schröderianum*, *D. bigibbum*, also *D. Dalhousieanum* and *D. formosum*, it apparently has a liking for, but it does not confine itself to these species. The presence of the insect is indicated by the small cleanly bored holes in the pseudobulb, both new and old, resembling the small holes found in old worm-eaten furniture; should these holes escape notice the leaves soon assume a yellowish appearance and the pseudobulbs begin shrivelling about an inch below the holes. If the pseudobulb is cut open a nest in a small cavity will be found containing one or more of the beetles, and the surrounding tissues will be in a state of decay. It is an open question whether the holes are first pierced by the adult beetle—an insect nearly the size of and resembling an ant—and the larvæ deposited therein, or whether they are hatched in the pseudobulb and afterwards eat their way out of it, as is the case with the *Cattleya* fly. This enemy may soon be stamped out if proper and timely precautions are taken. I advise an examination of the plants occasionally, and, if any traces of the beetle are found, to cut away that portion of the pseudobulb and burn it; in fact, should the plant be found to be badly infested, burn it altogether, and give the remaining plants a dressing of some insecticide.

RED SPIDER.—This insect pest is most troublesome, and on Dendrobiums more than any other Orchids; when plants are attacked by them and are unnoticed, serious results may follow, as they greatly reduce the vitality of the plants. They usually attack the under surface of the young tender foliage, and their presence can be detected by the leaves showing a whitish appearance on the upper as well as the under surface, which becomes more and more plainly visible as the insects increase, which they do very rapidly, causing the leaves to curl and dry up and probably fall off, almost completely arresting the further progress of any growth in course of formation, and greatly interfering with or destroying any prospects of flowering the next season. On the first appearance of this insect, immediate steps should be taken for its

destruction, and a constant surveillance maintained of all *Dendrobiums* and other plants growing in the same house in order to stop further ravages. Sponge the leaves occasionally with clean water, say every two or three days until they disappear, but in desperate cases use insecticides, mixed as previously advised, and sponge about once a week. Red spider will come, as other nuisances do, notwithstanding the most careful attention, and the conditions under which they are most likely to increase and thrive is that where there is a lack of moisture and the atmosphere is dry and hot from excessive fire heat.

ORCHIDS FROM SEED.

Raising Seedling Orchids is most interesting work, but the raiser must be prepared to exercise a great deal of patience, as with many of the species some years will elapse after the tiny seeds have germinated before the flowering stage is reached, whereas, with others, the period will be shorter; *Cypripediums*, *Masdevallias*, and *Calanthes*, for instance, will, under good treatment, bloom in three or four years. *Dendrobiums* require a longer time, whilst *Cattleyas* and *Lælias* and some others do not bloom perhaps under seven to twelve years, but despite this slow progress, keen interest is felt by the raiser and cultivator of the plants, from their earliest stage until they flower. Fertilisation is the first step towards obtaining seed, and this is done by what is termed "crossing," but not in a haphazard way. An intelligent hybridist exercises an amount of thought as to ultimate results and the means of producing them, and of course takes his chance of obtaining hybrids of great merit or otherwise. It is of no manner of use crossing flowers belonging to two different genera, such, for instance, as an *Odontoglossum* with a *Cattleya*, or a *Dendrobium* with an *Oncidium*, as the results would be nil. Genera having a close resemblance in form and structure may, however, be crossed with more propriety; *Cattleyas*, *Lælias*, *Sophranitis* and *Epidendrums* having a close resemblance in structure fertilise more readily. *Oncidium*s and *Odontoglossum*s also cross freely, and form pods of seeds, but I believe very few hybridists have been successful in raising plants from these crosses. Even *Oncidium*s and *Odontoglossum*s, if kept to their own genera, are most difficult to raise from seed, very few instances being as yet reported. *Cypripedium*s are the most easy to raise, and have been crossed and recrossed to such an extent that the family is now a very extensive one; and of late years many beautiful hybrids have been produced also of *Dendrobium*s and *Cattleyas*, and no doubt many more surprises are in store, and other treasures will year by year be seen. It is easy to imagine the anxiety and pleasure of the hybridist when he finds his seedling plants advancing to the flowering state and showing their first bloom buds, and still further their development into full bloom. In order to preserve them to a long life the plants should

be kept hardy, in exactly the same temperature as the parent plants, and not allowed to suffer from drought. Seedling *Cypripediums* may be pricked off at any time when ready, as they make rapid progress compared with other Seedling Orchids, but I do not advise the disturbance of small Seedling *Dendrobiums*, *Calanthes*, and *Thunias* after the middle of August, or *Cattleyas* later than the middle of September; if not done by then let them remain on the surface of the pot in which they were sown until the following spring, and then, when growth has commenced, prick off into very small thimble pots.

FERTILISATION OF FLOWERS FOR SEED.

When it has been decided which flowers are to be crossed—the blending and harmony of colours being the leading points in view—the selected seed-bearing parent should not on any consideration be a weakly plant. The pollen may then be taken from the flower, supposing, for instance, it to be *Cattleya Dowiana aurea*, and placed upon the stigma of, say, *Cattleya Warscewiczii* (such a cross in their native habitats being supposed to have produced the rare natural hybrids *C. Hardyana* and its variety *C. Massiana*). In this case of *C. Warscewiczii* and *C. Dowiana aurea*, the former becomes the female or seed-bearing parent, and the latter the male or pollen-giving parent, but the pollen-bearing anthers of the female parent must first be removed. When fertilisation has taken place the flowers will soon begin drooping and a seed pod form, which will require from nine to twelve months to mature and ripen, then the pod will split and begin to open, and the seeds should be sown at once, for if allowed to remain longer the pod opens wider and the seeds are wasted. To prevent the possibility of the first seeds—and these are considered by some Orchidists to be the only fertile ones—falling, the plant on which it is intended to sow the seed may be placed directly under the ripe pod, so that the seed, in case of shedding, may fall upon the surface of the compost. The Orchid, in the pot of which the seed is to be sown, should have been potted some months previously with the compost in a sweet and sound condition, not containing too much growing or living sphagnum, or the little seedlings may be destroyed. On this surface, after well watering it, the seed should be shaken, afterwards gently spraying with a fine syringe or watering can, so as to settle the seeds amongst the compost, the plant afterwards being watered when requiring it, but very gently at first, so that the seeds may not be washed too deeply into the pot, or away altogether.

I have had the best results from seeds sown in shallow pans or baskets in which Orchids were growing and suspended from the roof. If the seed is fertile and in a state for germinating quickly, it will show signs of doing so in from three to six months, when they assume the appearance of small green globules about the size of a pin's head, from

the centre of which a tiny leaf will soon form, and in this early stage these may be transplanted; indeed, it is best to transplant them as early as possible, for frequently the sphagnum surface on which they are growing becomes stale and dry, and woodlice, slugs, or ants cause the seedlings to disappear; but if taken away when they are large enough to be moved with a sharp pointed stick, on to some new, sweet compost, a fresh impetus is given to the little plant, and they then get a firm hold of the material in which they are for a while to find a home, and which is so necessary for their wellbeing. When the seed does not show signs of growth in from three to six months it rarely vegetates at all.

I prefer pricking off the little seedlings into what is known as thimble pots (one inch in diameter). These small pots should be half filled with small bits of charcoal or crocks, then filling level to the rim with chopped sphagnum moss and best fibrous peat, with the dust shaken from it, adding a little silver sand, mixing it well together and pressing it moderately firm into the pots. I then press down the compost with a pointed stick, making a furrow all round close to the rim of the pot, just sufficiently deep to admit and steady half-a-dozen of the little seedlings, using the pointed stick in doing this, and I moisten the tip of the stick, generally with my tongue, as the tiny plants then adhere to the point and can easily be deposited where required. Previous to filling the pots they should be soaked in water, especially if new, or they quickly absorb the moisture in the small amount of compost so necessary for the young seedlings. The compost should also be thoroughly damped previous to being used for the seedlings, after which the watering of them is a delicate operation, and must be done with the greatest care, until the little plants are steadied by their own roots. The pots containing the little seedlings are best nursed in the small wood baskets used for Orchids, accommodating from eight to a dozen pots in each, and suspending them close under the roof, where they are shaded from the direct rays of the sun. The baskets in which the pots are to stand should have more cross bars fixed in the bottom, to prevent their falling through—the air will then pass up between them and lessen the chance of too much moisture collecting around them, which is to be avoided. These very small pots, however, dry very quickly, and should be examined at least once every day and water given to the dry ones. I usually apply the water by dipping the hand into the water and let it drip gently from the fingers on to the plants, but it can be done in various other ways, so that it is done gently and without disturbing the little plants. Especial care should be taken with the seedlings during their resting season, as such small plants will not stand the same amount of drying and resting as established plants which have large pseudobulbs and have a much larger mass of material about their roots to retain the moisture, the

probability of the seedling plants becoming seriously dry must be guarded against. Some cultivators recommend that they should be kept wet and in a growing state, both winter and summer, but I object to this treatment on the ground that although the plants may possibly be brought into bloom a little earlier, those that have always been stewed in heat are seldom strong, nor have they the robust constitution necessary to maintain a lengthened existence; it is, therefore, wisest to grow on the seedlings in a similar temperature to that in which the old plants have been grown.

DISEASES OF ORCHIDS.

Orchids, like all other plants, are subject to disease, but this appears most frequently where a wrong course of treatment has been followed. *Cattleyas* and *Lælias* are sometimes attacked by a fungoid growth which causes the pseudobulbs and leaves to be marked their whole length with black marks and spots, and if not stopped in time it quickly destroys the plant by causing the pores to rot and become putrid. When these marks are observed the darkened point should be cut through with a sharp knife up the entire length of the mark, and a little dry slaked lime rubbed into the cut—this will sometimes prevent the disease from spreading any further. The disease, however, rarely occurs amongst healthy plants, and it may generally be attributed to a badly ventilated atmosphere, or to the compost about the roots being in a highly decomposed state. The genus *Phalænopsis* are subject to a disease known as “Spot,” which, if not cut out and powdered with lime or charcoal dust, will quickly spread. This “Spot” is caused by bad ventilation, and when the growth is too “sappy,” or from an excess of moisture during the dull days of winter. The foliage of *Miltonia vexillaria* is also subject to spotting, but only when it is grown in too cold a temperature, kept too wet, or when insufficient air is given during winter. The same may be said of *Vanda cærulea*, which is a plant that must be grown in a light, airy, and moderately warm atmosphere during the winter, or the leaves will become badly spotted. In fact all Orchids have some ailments, more or less severe if their treatment is wrong, and the safest plan is to well ascertain their requirements and see that these are obtained as nearly as possible.

WATERING AND RESTING ORCHIDS.

This must be regulated by their season of growth. For instance, a *Dendrobium* just starting into growth in early spring will require only very little water, just enough to prevent the compost from becoming dust dry, or in other words, enough to support the old bulbs with nourishment. When the growth gets a few inches high it will begin to make roots on its own account, and it is then that water may be gradually increased. Encourage this growth, after three or four

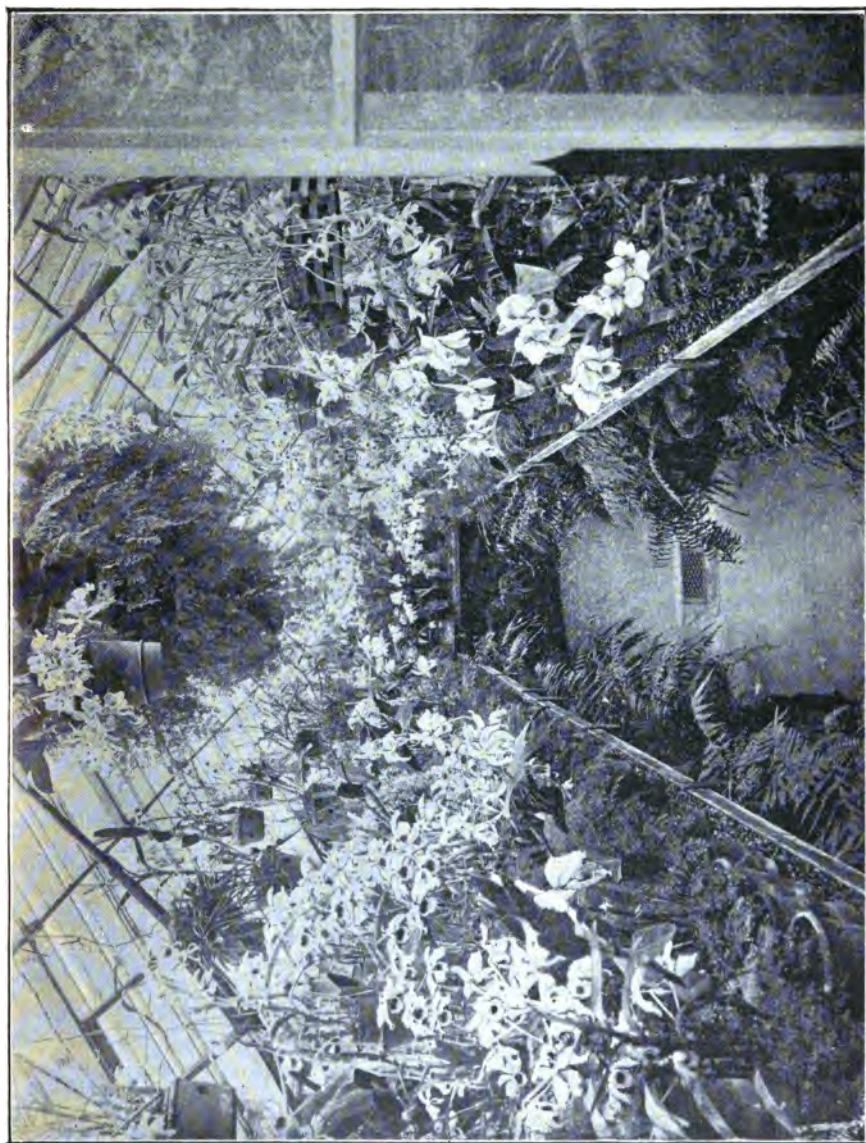
leaves have appeared, as much as possible until the bulb is formed, never allowing the plant to get thoroughly dry. I do not mean by this that it should at any period be kept constantly saturated. After the bulb is quite matured, water must again be gradually withheld, and it will then become so hardened that during the winter months water can probably be withheld for a long period, without shrivelling from the dryness of the atmosphere or the amount of fire heat required. This applies also to such plants *Cœlogynes*, *Cattleyas*, *Lælias*, *Anguloas*, *Catasetums*, *Mormodes*, *Epidendrums*, *Lycastes*, *Chysis*, *Trichopilias*, and *Thunias*.

The following, viz.: *Oncidiums*, *Odontoglossums*, *Vandas*, *Aërides*, *Saccolabiums*, *Phalænopsis*, *Miltonias*, *Masdevallias*, *Cymbidiums*, *Angræcums*, *Adas*, and *Cypripediums*, will require more water at the roots all through the winter months, but those which are dormant should be kept comparatively dry, only watering when the surface of the compost assumes a white appearance and is slightly crisp to the touch. It will be as well for amateurs to adopt the following rules in watering:—Never give a plant a little water because it is not dry enough to water thoroughly. If there should be any doubt as to the plant being sufficiently dry to require watering let it remain until the following day, when, should it be in a suspended pan or basket, let it be taken down and dipped in water, or, if in a pot, give it a good drenching with the watering can, bearing in mind that the Orchids in the smaller pots require more frequent waterings than those in the larger ones—always watering the compost, not the foliage. These remarks apply in a sense to watering in winter as well as summer, but during the winter months I do not exactly mean that a plant which is resting should be absolutely saturated by letting it soak in water, as it would be a long time before it was again dry. If it is a plant resting, simply give the surface of the compost a good watering with a watering can, and much will run off, but enough will soak in the compost to revive the plant, and that is sufficient. Make it a practice, should any water lodge in the young growths of such species as *Cattleyas*, *Lælias*, and *Dendrobiums*, to dry it out by means of a camel's hair brush. With Orchids of the same character as *Odontoglossums* and *Oncidiums*, this precaution is unnecessary during the summer months.

Resting is merely a term employed, which denotes that the plant has finished its season's growth, and henceforth lapses into a dormant state until the proper season arrives for renewed activity; plants which are at rest require but little water.

DESIRABLE POSITIONS FOR THE PLANTS.

In our glasshouses we cannot closely imitate the conditions under which the plants grow in their native habitats; still it is decidedly



ORCHID SHOW HOUSE AT HIGHBURY, THE SEAT OF THE RIGHT HON. JOSEPH CHAMBERLAIN, M.P.

advantageous to their wellbeing when we can arrange to reproduce as nearly as possible their natural surroundings, and this, combined with good attention, are undoubtedly the two most important points to be observed in their cultivation; for if an Orchid is given a place which suits it, and due attention is paid to the plant and its natural requirements, success and credit to the cultivator will be assured. Theory is, however, a great help to the practical man, and much information may be gained from the writings of others, which, if used in conjunction with experience already acquired, will lead to a better appreciation of his work and bring out many important points for his study and consideration, thus increasing each year his store of useful knowledge, a circumstance not to be despised by any cultivator, however eminent. When Orchids are growing satisfactorily, and look healthy and well, it is a conclusive proof that the conditions under which they are grown, and the position they occupy, are in every way suitable.

Sickly plants are always to be found in every collection, and their unhealthiness may be attributed to various causes, the true one invariably being traced to the fact that some simple want has not been attended to or is not understood. Thrip and other insects find it more difficult to make headway and increase when plants are in their proper element. As to position, some plants will thrive the year through without change; whereas, with *Dendrobiums* and others frequent changes and re-arrangement are beneficial.

Some Orchids such as *Cypripediums*, and Cool-house kinds, thrive better in the shade, whilst *Cattleyas*, *Lælias*, and *Dendrobiums* prefer more light. Some do best when suspended, others placed on a side stage, whilst instances have occurred when a plant failing to grow at one end of the house has thrived and grew luxuriantly when moved to the other end. A casual visitor would probably fail to see any reason for this; but it would soon become evident to the grower that the plant experienced a decided advantage in one position denied to it in the other. In many cases this is caused by the plants getting a better current of air, or more moisture, more sun, or shade, or any other thing conducive to its well-doing.

I find shelves to be extremely useful in this respect, and use plenty of them hanging over the paths, from 12 to 18 inches from the glass, also over the door and at the far end of the house, or in any other place where they do not obstruct the light much from the plants on the stages. These shelves meet the requirements of some Orchids to perfection, especially those which require light and air, or are shy bloomers when grown on the side stages with other plants. They are admirable places to resuscitate weakly plants; while I always prefer them for my very choicest and rare specimens. This subject will be treated on more fully when referring to Cool, Intermediate, and Warm houses.

ORCHIDS IN BLOOM.

When Orchids are in flower they should not be allowed to become very dry at the root, or the flowers will draw too largely upon the reservoirs of the plant, greatly exhausting it, and sometimes lead to its entire collapse the following season; neither should the flowers be allowed to remain on the plant for too long a time, especially if the plant is at all weak. *Oncidiums*, *Odontoglossums*, *Phalænopsis*, and *Vanda cærulea*, suffer from this cause more than other Orchids, as these kinds generally throw large spikes with a great number of flowers upon them, and should not be allowed to become too dry. Should the plant be in a weak condition and allowed to flower, the blooms must be cut immediately, or the plants will be still further weakened and probably dwindle away. The removal of the flower is no deprivation to the owner, as it will keep a very long time in water. Even where strong and vigorous it is not advisable to allow the spikes to remain on the plant more than a fortnight. Any small glasses or neat little vessels for holding the flower spikes can be judiciously placed among the plants, and but few casual observers would notice that the flowers had been removed from their parent stems.

PLANTS THAT MAY BE GROWN WITH ORCHIDS.

The culture of Orchids need not in any way lead to the exclusion of the beautiful foliage or flowering plants, and especially Ferns, which are generally found in every greenhouse; in fact, it would often prove to be a distinct advantage to these plants to be in the same house, as the atmosphere is more suited to their requirements than that generally maintained in an ordinary greenhouse. There are, however, some plants which would probably not be a success if grown with Orchids during summer, but could be wintered very well with Cool Orchids. I refer to such as *Pelargoniums*, *Fuchsias*, tuberous-rooted *Begonias*, *Hydrangeas*, *Azaleas*, *Camellias*, *Cyclamen*, *Primulas*, and others—these are best grown by themselves if possible during summer.

The class of plants most suitable for growing with Orchids are Ferns, small Palms, and pretty foliated plants, all of which give comparatively little trouble in growing, are not so subject to insect pests, and are in harmony with the Orchids. There are also some of the more beautiful and not yet too gaudy flowered stove and greenhouse plants, which will flower well in the Cool Orchid-house, on account of its being kept moist, shaded, and with a genial growing atmosphere. Amongst the many pretty and suitable plants are the winter-flowering *Begonias*, also some of the charming ornamental-leaved section, many of the Palms and Ferns, *Abutilons*, *Pilea muscosa*, *Aralias*, *Asparagus plumosus*, *Asparagus deflexus*, *Crotons*, *Cyperus*, *Dracænas*, *Isolepis*,

the pretty variegated *Panicum* for a front fringe to the Orchid stage, *Pellonias*, *Eulalias*, *Selaginellas*, *Tradescantias*, and many others, but these names are sufficient as a guide.

For the Intermediate Orchid-house, such plants as the following may be used: *Allamandas*, *Aristolochias*, *Hoyas*, *Bougainvilleas*, *Cissus discolor*, *Passifloras* as climbers on the rafters, but so as not to obstruct light more than can be helped; also *Coleus*, *Anthuriums*, and other plants mentioned in the Cool-house list.

For the warmer, or Hot-house plants, requiring more heat, then, such as *Alocassias*, *Gardenias*, *Nepenthes* (the pitcher plant), *Eucharis*, *Gloxinias*, *Euphorbias*, *Gloriosa*, *Ixoras*, *Hibiscus*, *Poinsettia*, *Pancratiums*, *Pandanus*, *Crotons*, and others. It should be remembered, that when Orchids are grown in company with other plants, the Orchids must have the first consideration, and be given the position most likely to suit them. By standing them on inverted flower pots they can be kept well above the foliage of other plants, thus enabling the air to circulate freely about them, and at the same time admitting plenty of light; in no case must the plants be allowed to become infested with insects or serious results may ensue. If it can be arranged, without danger of shading the Orchids underneath, a few of the best warm greenhouse or stove climbers may be grown and trained to the rafters, but it must be borne in mind that some of these climbers are subject to mealy bug and other troublesome insects which will need careful watching and attention.

THE COOL HOUSE.

This illustration represents a model house for a new structure for Cool-house Orchids, and it should have east and west side aspects, so as to get an equal amount of light. *A.* shows the bottom ventilation, which should be on a level with the hot-water pipes and protected inside with perforated zinc, with the holes not too small, but sufficiently so to keep out vermin. *B.* shows top ventilation, and *C.* shows side ventilation, which is very beneficial to Cool Orchids, if opened slightly when the atmosphere outside is damp and not very cold, but they should not be open in very dry or cold weather. *D.* shows the framework to support the roller blinds, and *E.* the roller blind. *F.* is the end section, showing the centre and side stages, which should be open wood-work, so that the air may have free circulation amongst the plants. *G.* indicates the slates or tiles supported on bricks, immediately over and three or four inches from the pipes, and on these half decaying leaves of trees should be placed at intervals, to throw off a nice moisture impregnated with ammonia from the leaves, and assimilated with the dry heat from the pipes. *H.* is the soft water tank, a great essential in an Orchid-house. If a supply from an outside pressure from water-works in the town should exist, and an india rubber hose sufficiently

long is connected, the entire length of the house can soon be damped down—and this is so often needed in hot, dry weather—thoroughly watering every available space about the floor and stages, without watering the plants over head. If a syringe has to be used for this purpose, much longer time is required.

THE INTERMEDIATE HOUSE.

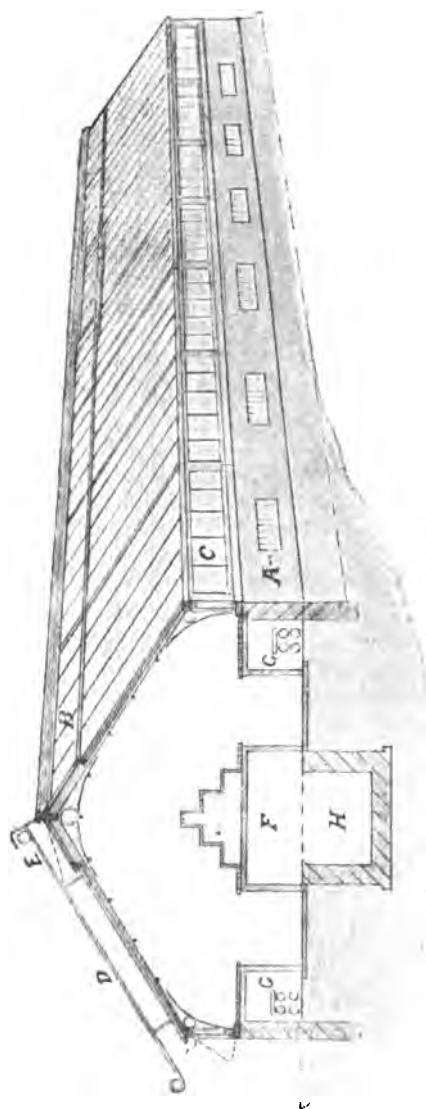
Such a house running from east to west, the sides having one a northern, the other a southern aspect, would enable an amateur to grow a still greater variety of Orchids successfully—those requiring a great amount of light being placed on the south side, and those loving shade on the northern side. This house is identical in structure with the Cool house, with this exception, that it is convenient to have the house higher, as some of the Intermediate-house Orchids have a taller habit of growth and require more head room; and the side ventilation, except that opposite the pipes, may also be dispensed with. The centre stage need not be quite so high as in the Cool house, and can have wider top space to accommodate tall growing specimens. The same arrangement will be required for the leaves over the hot-water pipes as is advised for the cooler house.

THE WARM, OR EAST INDIA HOUSE

should have the same aspect as the preceding structure, so that full advantage may be taken of the light and shade afforded, and which is so necessary to the occupants of this house. The roof should be high, and somewhat flatter, but well supported, in order that the interior may be utilised to its full extent for suspending plants, many of the Warm-house Orchids thriving much better when near the glass. The centre stage (F.) should be rather lower than figured, the soft water tank running the full length of the stage; and it is a good plan to run a one-inch pipe right through the water in the cistern, and connected with the other pipes, so that the water for the supply of the plants may be warmed to about ten degrees above the temperature of the house, as it then gives off a moisture most beneficial to the plants when in a growing state, but during the growing season only. Care must be taken not to have the one-inch pipe too hot, or steam will be generated to such an extent as to injure the young growth of the plants, causing spot or rot. Should no tank exist, it then becomes necessary to have a supply of water in the house for watering purposes, either in cans, pails, or other utensils, which should be placed in the house sufficiently long to be warmed as nearly as possible to the temperature of the house.

As this structure is high, necessitating perhaps more side glass, it is advisable to have roller blinds fixed on the south side of the house as well as on the roof, although a permanent shading of whiting, mixed

A MODEL ORCHID HOUSE.



REFERENCES ON PAGES 57 AND 58.

with milk, can be used, or summer cloud will answer the same purpose; but roller blinds are much to be preferred, as they can be rolled up in dull weather. Side ventilation (not bottom) is unnecessary, and what is known as "drip" must be prevented, drip being caused by water from the moist atmosphere condensing on the roof and running down the sash bars on to the plants, saturating them and causing loss of the young growths and pseudobulbs. This is most to be feared in the Warm house, where the roof is flatter and a larger amount of moisture is required for the plants, or in cases when the house has not been properly constructed for Orchid culture. Horticultural builders have of late paid much greater attention to this subject, the sash bars being so constructed that all condensed moisture on the roof is collected and carried away by means of a channel or furrow, formed on either side of the sash bars. If the drip is found to be very troublesome, in the absence of these furrowed sash bars, it can be dealt with, to a great extent, by fastening small strips of zinc in the form of a gutter to carry away the water.

EVAPORATING TROUGHS, on the pipes, are aids to the assimilation of moisture with the atmosphere, and for helping to keep down such insect pests as thrip and aphids. By keeping the troughs regularly supplied with water, and placing in them any waste tobacco or other substance containing nicotine, the fumes arising therefrom will have a beneficial effect upon the plants.

MANURE AID TO ORCHIDS.

This is somewhat dangerous ground to tread upon, but a few words on the subject must be written. The structure of an Orchid and method of deriving nourishment being so different to that of most exotic plants, it behoves the cultivator, before applying manure as he does to other plants, to consider what is the proper manure to use, and how and when to apply it. Orchid growers have no doubt used manures, some are still doing so, but as a rule their experiments are made entirely in the dark, sometimes with good results, and at other times the plants give no evidence of any improvement but are frequently the worse for its application. My own experience, gained by practice in cultivation, is, that as a rule, harm would be done by applying artificial manures to the roots of the plants, as advised by some growers, unless under exceptional conditions. Growth can be assisted by applying manurial aid atmospherically, and all the help that epiphytal Orchids require at our hands is, that the compost should be kept sweet and sound, and not allowed to get into a sour and decomposing state, using clean soft water and administering pure air on every favourable occasion, for they derive so much of their nourishment from the atmosphere by means of their roots and the under surface of the foliage.

Soot water is an excellent thing to apply to the paths for evaporation, but those living in large smoky towns would never dream of applying soot, the air being already sufficiently charged with it. Lime water can also be used, but I doubt if it would be beneficial in districts where the water supply comes through chalk. Guano, in small quantities, sprinkled on the floor occasionally, I never knew to do any harm, and I have often thought that plants showed increased vigour and strength when it was used in this way. I also use liquid farmyard manure, by pouring the contents of a small watering can on the floor occasionally, and of an evening when all is quiet. The evaporation from such stimulants being desirable, not so much for inducing moisture as for producing a manurial stimulant in the atmosphere. Cultivators will also please to remember the plan I have already indicated (*see page 57*) of providing a supply of new leaves, laid on slates or tiles raised a few inches above the hot water pipes, to produce evaporation and assist in maintaining an even moist temperature. I have at times poured weak liquid manure into the troughs on the hot water pipes with good results, the ammonia from it escaping gradually into the house.

PROTECTION FROM COLD DURING WINTER.

Although we cannot do without fire heat, every successful cultivator tries to do with as little as possible; of course, duly considering what the requisite temperature should be and the health of his plants require. In very cold weather, when it is necessary to drive the fire hard, an impoverishing aridity in the atmosphere of the house is the result, and even then the thermometer may still show a temperature below the given point. It frequently happens that plants, especially those near the roof or standing near the glass ends of the house, have, in the morning, a heavy dew-like moisture on them, and this sometimes remains on the plants the whole day. This is not a satisfactory state of things for the plant, and is brought about by the condensation that arises from the extreme cold air outside acting upon the glass with very much warmer air inside. A simple and effectual remedy in such a case is to apply some kind of protecting material in cold weather, such as garden mats, canvas, or pieces of sailcloth, either of which would make a difference of from five to ten degrees in the warmth of the house, especially when the doors and further end of the house is protected. Some persons leave the roller blinds in position for winter protection of the roof, but, as a rule, the canvas is too thin to be of much service and soon wears out with the winter weather and storms. Whatever is chosen for covering should be so arranged as to be convenient for use and removal when not wanted. I have occasionally kept the roof so covered, both night and day, in extremely cold or very windy weather, for if the plants are receiving plenty of light at all other times, a day's comparative darkness now and then does no harm.

EXCESSIVE HEAT TO ORCHIDS.

I have already deprecated any attempt to force Orchids prematurely into flower or growth, by giving them a much higher temperature than they ought to have. To ensure free healthy growth I wish again to warn young growers of the dangers to the health of the plant by so doing, for, from this cause alone, many plants are weakened in constitution, and get into a debilitated state, from which they do not easily recover. This will apply to all species, but more especially to those recognised as "Cool-house Orchids," these certainly will not submit to excessive heat; and nothing could be more suicidal than to attempt to force the flowers to expand at a given date, by placing the plant in extra warmth. Should this be done for exhibition, or for any other purpose, no surprise need be felt if the plant is reduced in vitality, and become an easy prey to insect pests; while no appreciable difference is made in the time of blooming, indeed, in some cases it is later, while in others the flowers may be a little earlier but of an inferior quality, and shorter lived than when allowed to develop gradually in their proper temperature. Instead of forcing, it is much safer to retard the blooming, but even this I do not recommend. The time of flowering of a few Orchids may, however, be made earlier or later than its usual period, if desired, by a systematic gentle application of more warmth or cold during the time the plants are pushing their flower spikes. The treatment for the first year may make very little difference, but in the succeeding years it will be more apparent, and the plants remain healthy and strong. Some species of *Dendrobiums* are more amenable than most Orchids to this treatment in the matter of flowering at an earlier date, and when sound plants are grown of such species of *Dendrobium* as *Wardianum*, *nobile*, *aureum*, *Ainsworthii*, *lituiflorum*, *Devonianum*, and *Pierardi*, the greater part of which flower at the latter end of February, it is easy to extend their blooming period, say from January to the end of March. I have often had them in flower at Christmas, but it is too early for them, the flowers being weak and few, and the new growth much weakened. If it is desirable to have *Dendrobiums* by the beginning of February, they should be taken from their resting quarters with a cool, dry temperature of between 45 to 50 degrees, and, after being sponged over, and examined for red spider, and tied up neatly to fresh sticks, the plants should be removed and gradually inured to a warmer place in the Intermediate house, where they can have plenty of light, watering them very carefully, or the flower buds may turn yellow and die, or run to growth instead of flower. If the instructions given are followed, the blooms will be better coloured than if pushed on all the time in a warmer house; no excessive measure must be brought to bear upon them, either to "retard" or to "hasten."

Plate 3.



- 1—*Dendrobium Phalaenopsis* (light variety, two flowers).
 2—*Dendrobium Phalaenopsis* (dark variety). 3—*Masdevallia Harryana*. 4—*Laelia Dayana*.
 5—*Oncidium Forbesi*. 6—*Oncidium tigrinum*. 7—*Odontoglossum grande*.
 8—*Miltonia Roezlii*. 9—*Dendrobium* x *Cassiope*. 10—*Laelia anceps*. 11—*Laelia albida*.
 12—*Calanthe Veitchii*.



BLAKE & BAKERDIE.

LIVERPOOL.

AUTUMN AND WINTER FLOWERING ORCHIDS.
(SOME OF THE FLOWERS ARE MUCH REDUCED.)

TREATMENT OF ORCHIDS THROUGHOUT THE YEAR.

FOR TEMPERATURES, SEE TABLE, PAGE 31.

JANUARY.

COOL HOUSE.—*Winter Temperature.*

During this dark, dull month scarcely any potting will be required, but attention should be given to cleanliness, ventilation, watering, &c. Open the bottom ventilators, more or less, in accordance with the outside conditions; and if that should be damp and mild, the top ventilators may be opened a little, especially on the leeward side, and a little fire heat used to temper the atmosphere and promote the circulation of air. Should excessive cold weather prevail, it will be best to close all the ventilators and have the hot-water pipes sufficiently heated to keep the thermometer at the proper degree of heat, also affording a little more moisture both to the roots and in the atmosphere than is required in dull, damp weather. In mild weather damp down about once a day, and twice when much fire heat is used. Generally speaking, all growing plants should be more sparingly watered at this season of the year. Plants which are dormant (resting), such as some of the Dendrobies, Coelogynes, Anguloas, &c., may have sufficient water only to prevent the pseudobulbs from shrivelling. The autumn-flowered Pleiones may be repotted and suspended near the roof, giving but little water at first. Examine all the plants and clean them, wash their pots when wanted, look well after slugs, and if any signs of thrip should be visible—and their work may soon be detected in the centre of the young growth, which then assumes a light-tinted sickly appearance and showing a small watery-looking mark—then dust a pinch of tobacco powder well into the growth affected. Thrip and slugs are especially fond of the young flower spikes and buds as they appear from the sides of the pseudobulbs, and should be watched for as previously advised.

INTERMEDIATE HOUSE.—*Winter Temperature.*

Keep the temperature up in cold weather and temper the atmosphere by the admission of fresh air, given chiefly through the bottom ventilators, and damping down the floors, &c., once or more

a day as may be requisite; and during mild weather a few degrees may be added to the temperature, but avoiding any approach to a stuffy, close atmosphere.

When in smoky towns fogs are common, during the time they prevail the atmosphere should be kept rather more moist and warm than usual; and the evergreen Orchids, especially those which should be kept comparatively dry, such as *Cattleyas* and *Lælias*, should then not be too dry at the roots, or the foliage would probably suffer and prematurely drop, greatly weakening the plant. Immediately after a dense fog it is most advisable to look over the plants and sponge the leaves with clear rain water, in order to remove the sediment deposited thereon.

THE WARM, OR EAST INDIA HOUSE.—*Winter Temperature.*

This heat should be maintained if possible, with a little bottom air if the weather permits, and moisture applied, by damping down the paths, &c., about twice a day, according to the amount of fire heat employed. *Cypripediums* may be repotted; *Calanthes* which have done blooming should be placed on a shelf close to the glass and kept dry. Use tobacco powder on all plants when thrip is found, and keep a sharp look out for red spider on the young foliage of *Dendrobiums*, and any *Dendrobiums* in bud or in flower may be kept a little moist at the roots. Bring in a few of the *Dendrobiums* resting in a cooler house.

FEBRUARY.

COOL HOUSE.—*Winter Temperature.*

With increased sun heat the day temperature of this house may rise three degrees; continue the same care in ventilating, damping, watering, and the detection of insects, and always have a sufficient amount of fire heat and no more. The repotting of any *Odontoglossum crispum* and its allies, as they go out of bloom and begin making new growth, may be proceeded with, and pick over the surface moss of others in the same stage of growth which are in good condition, and top dress with fresh sphagnum and peat. (See note under the heading of *Odontoglossum crispum*.)

INTERMEDIATE HOUSE.—*Winter Temperature.*

As the potting season will now be coming on, have a supply of good fresh sphagnum moss ready for use, also some good fibrous peat at hand when wanted, and mix as I have already explained. Have tie-up sticks ready of various lengths, and paint them green; and procure some clean leaves of trees ready for placing above the hot-water pipes as previously recommended (*see page 57*). Get plants cleaned, and look well to the *Cattleyas* for the ravages of scale, &c., alluded to on

page 45, and guard against thrip, especially on *Miltonia* (*Odontoglossum*) *vexillaria*, by dusting tobacco powder into the young growths. With the exception of perhaps a few of the *Cypripediums* that have done flowering, also some of the earliest *Cattleyas* that are emitting new roots, but little repotting or top dressing is needed.

WARM HOUSE.—*Winter Temperature.*

Phalaenopsis may now be attended to by having the old moss picked out from the roots and fresh supplied, as also *Saccolabiums*, *Aërides*, *Angræcums*, and *Vandas*, attend also to *Miltonia Roezlii*, and a fresh supply of tree leaves given above the pipes. Let a sufficient quantity of fresh air be admitted with care daily through the bottom ventilators, avoiding cold draughts which would check growth and produce other evils. Should the Orchid houses form a range and open one into the other, ventilation can be obtained at this time of the year by opening the doors, and, if it can be managed, air from the Cool house should pass on to the Warm house through the open doors. Cockroaches congregate mostly in this house and should be poisoned. Bring from the Intermediate house the remainder of the *Dendrobiums* to encourage blooming, and when out of flower see to the condition of their roots, and start them into growth watering them with care at first.

MARCH.

COOL HOUSE.—*Spring Temperature.*

Continue the watchfulness in general matters. The days are now gradually lengthening and the light stronger, and watering at the roots may now be increased without so much fear of bad results following. See also that the roller blinds are fixed on the house early in the month so as to be ready for use, as it is best not to expose Cool-house Orchids to sudden bursts of bright sunshine at first, as it sometimes causes an excess of bronze tinted colours in the foliage of *Odontoglossums*, which in a modified way is not so objectionable, as it indicates sturdy health from being kept hardy and from exposure, but it is not well to have too much of it, as it sometimes leads to a loss of foliage. Ventilate freely on all suitable occasions, both night and day, but beware of piercing east winds, which oftentimes are accompanied by bright sunshine and runs the thermometer up rapidly, and prompts the cultivator to put on more air to reduce it. In order to avoid this keep the ventilators closed, thereby preventing the cold piercing wind from entering the house; and, if necessary, lower the heat of the hot-water pipes, and shade by running down the roller blinds. Continue to repot any plants in this house as they arrive at the right condition, which is when the new growth is an inch or two high. Damp down two or three times a day.

INTERMEDIATE HOUSE.—*Spring Temperature.*

The season of active growth is at hand, and, with more warmth, the plants will soon begin to push out roots, and as soon as this is seen the plants should be repotted, supposing they are out of flower; a slight increase of water may be given to the roots, seeing that the water does not lodge in the young breaks. Get roller blinds fixed in readiness for use and for protection from sun, and when there are cold cutting winds keep the house closed. Watch for the *Cattleya* fly alluded to on page 46. *Lælia anceps* and the other Mexican *Lælias* should be repotted this month where necessary and thoroughly cleaned; towards the end of this month watch for the spikes of *Odontoglossum citrosmum*, and give the plants more water. Repot *Anguloas* if necessary. Damp down two or three times a day.

WARM HOUSE.—*Spring Temperature.*

Shading should now be in position and ready for use. Be careful that *Dendrobiums* are not over watered, and protect Orchids from drip from the roofs (*see page 60*). At this season the condensed moisture sometimes gets frozen underneath the glass, and in thawing drips on to the foliage, causing the young growth to damp off. *Thunias* and *Calanthes* may be repotted (*see Cultural Directions, page 36*). Look out for red spider, and sponge the leaves with insecticide. Much care is necessary in ventilating, so as to ensure circulation without the atmosphere becoming cold. Arrange near the glass all plants requiring light, and those wanting shade further away.

APRIL.

COOL HOUSE.—*Spring Temperature.*

We often have changeable trying weather in this month demanding constant watchfulness, and it is better to use the shading freely than to admit cold air through the ventilators; keep a regular supply of moisture on the paths, stages, and other surfaces. Very little heat will now be wanted from the hot-water pipes in this house, but as the nights are often cold, a little heat should be given. Be always on the look out for thrip, for if it gains a strong foothold this month it will probably remain all the summer, in larger or smaller quantities. The repotting of *Odontoglossum crispum* and others of similar growth should still continue throughout the summer when they arrive at the proper stage, always expecting them to shrivel a little afterwards. The repotting of all other Cool Orchids may be pushed on with as they are ready; but little heat will now be required from the hot-water pipes unless the nights are very cold, as is sometimes the case, then a little more heat must be used, also ventilating at the same time.

INTERMEDIATE HOUSE.—*Temperature generally the same as for March, but a few degrees higher does no harm if the weather is warm; fire heat during the day may be dispensed with in warm weather.*

Shading should now be in use for a few hours when the days are bright with sunshine, but inure the plants gradually to the influence of the sun after the dull winter; even the Mexican Orchids which will stand a great deal of sun become scorched when too early exposed after so much sunless weather, and with bright sunshine by day and frost at night it is advisable to maintain a sufficient amount of moisture, as the plants, if in too dry a state, may suffer at such times. Where the roots of Cattleyas and any Orchids may be pushing into growth the plants should be at once taken in hand and repotted, or top dressed, as may be best, for if the new roots are allowed to get too long before doing so they get injured. Damp down the floors, &c., two or three times a day.

WARM HOUSE.—*Temperature, day with sun, 80°; day without sun, 73°; night, 70°; morning, 65°.*

This month is generally a busy one, and the sooner the plants are attended to after flowering and got into their growing quarters the better. It is necessary to be very careful in watering Dendrobiums just starting into growth, especially *D. Bensonii* and *D. superbum*. A uniformly moist atmosphere should at this season be constantly maintained, allowing it to become somewhat dry at mid-day, and keeping a watchful eye for red spider and thrip. Most of the Dendrobiums will now have pushed their flower buds, and should be placed in their growing quarters, and careful watering observed for all species.

MAY.

COOL HOUSE.—*Summer Temperature.*

Well damp down at least three times a day; in hot weather at this season spraying the plants slightly overhead will do no harm if done in the afternoon of a drying day, but I do not approve of damping the plants overhead as a general rule. If the atmosphere is properly attended to fire heat should not now be requisite, provided the weather is not exceptionally cold for the time of the year. When the sun gets upon the house in the morning let down the blinds, allowing them to remain down until all fear of the temperature being increased has passed. Do not close the Cool Orchid house by shutting the ventilators as the sun is declining as is customary with Warm houses. Cool Orchids are easily injured by heat and object to this close heat, therefore, air should be left on day and night, in large or small quantities, as required. Attend to repotting as the plants go out of

late 3.



1—*Dendrobium* P
Dendrobium Phalaenopsis (dark v
 5—*Oncidium* Forbest. 6—
 —*Miltonia* Roezlii. 8—*Dendrob*

condition. Keep up an abundance of moisture in the atmosphere, as it is well nigh impossible to use too much water about for evaporation.

INTERMEDIATE HOUSE.—*Summer Temperature.*

Plants will now advance very rapidly, and in all weathers the plants must have every encouragement to promote quick growth by giving liberal supplies of water at the root, and moisture in the atmosphere of the house, and this can be easily secured by damping down frequently, provided proper ventilation secures a gentle circulation of fresh air. A fresh supply of tree leaves saved from last year should be placed under the stages above the pipes, and watering now should be done in the afternoon or evening. Cattleyas, and indeed other Orchids, often have a little shrivelled appearance after flowering, but soon regain vigour and plumpness with liberal treatment. Be sure and keep a sharp look out for the Cattleya fly and pay strict attention generally to cleanliness, for at this season scale of various kinds are rather troublesome, and increase at an alarming rate.

WARM HOUSE.—*Summer Temperature.*

Warmth from the sun is most beneficial to the plants at all times, and but little fire heat may now be used, except during cold or chilly dull weather. Keep a sharp look out for the Dendrobium beetle; and it is advisable at this season to continue a supply of tree leaves, or, failing these, some other material for giving moisture, by placing them under the stages, and thereby materially assisting the plants. Keep up an abundance of moisture and look well after any signs of thrip or red spider. Calanthes should now be well rooted and may receive more water. This will be a busy month in all departments, for a great many Intermediate and Warm Orchids require repotting between April and the present time; a few only should be done later.

JULY.

COOL HOUSE.—*Summer Temperature.*

Should the heating apparatus require repairing or altering, this is the most suitable month to get it put right, letting the work be completed as speedily as possible, certainly by the middle or latter part of August. The repotting of all kinds of Cool Orchids should still be gone on with, and if the sphagnum moss on the surface of the pots begins to cover the pseudobulbs, it should be pressed neatly down with the fingers whilst it is wet, but it may ultimately become necessary to remove it and substitute a fresh top dressing of sphagnum, which will probably also grow. I have often heard it remarked that Orchids make no growth unless the sphagnum is doing so. That Orchids generally do well when the sphagnum grows freely I admit, but it is not absolutely necessary for the welfare of the plants.

INTERMEDIATE HOUSE.—*Summer Temperature.*

If thrip should get a firm hold of the plants, now that they are making growth, the foliage is soon disfigured, but its presence may be detected by the appearance of brown marks on the young foliage in course of formation, and when once the insects get down into the centre and under the skin which shield the young bulbs it is impossible to dislodge them by fumigation alone. Tobacco powder should then be used, sprinkling a pinch down the axils, but it is wisest to look out for thrip in its earliest stage, and be on the watch for any sign of the Cattleya fly, which will attack such species as *C. Mossiae*, *C. Mendelii*, and *C. Trianae* in particular. Damp down at least three times a day, and take care that no burning occurs from insufficient shading. Very little repotting will now remain to be done, and any Orchid that has finished its growth may receive more air, but let the same amount of water be given for a time.

WARM HOUSE.—*Summer Temperature.*

As the new growth of *Dendrobiums* increase in size, and form fresh roots, a little weak liquid manure may be given (*see page 60*). Dryness at the roots, or a dry atmosphere are most undesirable just now, as the plants are in active growth and should have no check either from this or any other cause. A gentle spraying overhead may now be beneficial in the afternoon or during very dry weather.

AUGUST.

COOL HOUSE.—*Summer Temperature.*

Continue to maintain a free circulation of air, keeping the atmosphere as cool, yet as moist as possible, bearing in mind that these plants grow chiefly at a great elevation where the atmosphere, although heavily charged with moisture, is still buoyant, conditions which a cultivator should endeavour to imitate. When it has been necessary to use a permanent shading through the summer months, it should now be reduced in density by having a good portion wiped off. Plants in which the pseudobulbs have completed their growth must now have water supplied to them in lesser quantities. Keeping the plants free from insect pests requires considerable time and perseverance at this hot season. Slugs are also on the alert in damp houses and should be trapped.

INTERMEDIATE HOUSE.—*Summer Temperature.*

During this month many of the pseudobulbs reach maturity, such as *Cattleya Trianae*, *C. Warscewiczii*, and *C. Dowiana aurea*. Let the plants be placed near the light at the coolest part of the house, close to a ventilator, and reduce the quantity of water, or they will commence a second growth, and this should be avoided if possible, as second growths rarely come to maturity until very late in the autumn. The two

last named Cattleyas having flowered, the old flower sheaths should be entirely removed, as they are liable to decay in dull wet weather, and unless this is done in time the base of the leaf may be affected and drop before it is observed, the rotting or decay passing downwards and soon affecting the newly made bulbs. The old sheath should be cleanly removed. By a slight pull sideways it will slip easily away, and renders decay improbable. Continue to damp down freely.

WARM HOUSE.—*Summer Temperature.*

Fire heat, on all occasions, both day and night, may generally be safely dispensed with during this month. Dendrobiums should be looked over now, and all that have finished up their pseudobulbs removed to more cool, airy, dry, and sunny quarters to prevent second growth, always taking care that the change is gradual so as not to give an unnecessary check, and after they are by degrees fully exposed to both air and sun continue to water but not quite so often. Many kinds, such as *Dendrobium Wardianum*, *D. nobile*, and *D. crassinode* delight in a long rest, in a house having a cool, free ventilation, and full sunlight. Such treatment greatly assists the plants of such kinds as I have named in acquiring a strong constitution and they flower more freely; but all the Dendrobiums will not stand this treatment. It has become necessary for the cultivator to find out whether his particular plant requires a Warm house or a moderately Cool one to rest in, as much depends upon the winter treatment the plant receives. No more shading should be used than is absolutely necessary, so that the growth may get well matured as it is formed, and produce short, stout, well hardened bulbs, which should be the aim of every grower—thin sappy growths being of little use. Damp down freely.

SEPTEMBER.

COOL HOUSE.—*Temperature, day with sun, 68°; day without sun, about 63°; night, 55°; morning, 50°.*

The repotting of *Odontoglossums* of the *crispum* type should be discontinued after the end of this month, such is my experience, especially in large towns where the winter light is bad. All Cool Orchids are materially strengthened by the dewy night air being admitted through the ventilators, which should not be fully closed during this month. Continue to damp down well and gradually use less shading.

INTERMEDIATE HOUSE.—*Temperature, day with sun, 70° to 75°; day without sun, 68°; night, 63°; morning, 60°.*

Many more plants will now be fast approaching maturity, and any Cattleyas which have not completed their growth should now be placed in the warmest part of the house, and those which have finished their

growth at the coolest, where a goodly amount of air can be given. The cool night air of September, properly admitted, braces and strengthens all species of Orchids growing in Intermediate houses, their slender pseudobulbs increasing in sturdiness and plenty of new ones are formed, and the foliage assumes a bronzed appearance or an intense green colour. It is as well to defer the use of fire heat until the last moment, 60 to 65 degrees being a good night temperature. Below 60 degrees a little fire heat is necessary. Air may be admitted this month rather more freely, but damping at least two or three times a day.

WARM HOUSE.—*Temperature*—this should now be reduced in accordance with the shorter days and colder weather, but give fire heat at night—day with sun, 75° to 85°; day without sun, 70° to 75°; night, 70°; morning, 65° to 70°.

Calanthes will now be throwing up flower spikes, and a little liquid manure will be beneficial to them, but they should neither be too wet at the root nor too dry. Remove any permanent shading on the glass, and use the roller blind only when necessary; but in giving more light in this way do it gradually, so that no plant suffers by exposure. Such Orchids as *Phalænopsis*, *Saccolabiums*, *Aërides*, &c., will be best in a shady position, as these plants are often most seriously injured by subjecting them to the treatment given to others. Many more *Dendrobiums* may now go into cooler quarters, but be careful not to take those requiring a warm winter temperature. Damp down two or three times a day.

OCTOBER.

COOL HOUSE.—*Autumn Temperature.*

Fire heat will again be necessary if the nights get too cold, it being best to have gentle warmth in the pipes, and ventilation on, than to have the house shut up without the warmth, as such treatment often produces fungus or mildew in the form of spots on the under surface of the foliage of *Odontoglossums*, and, if not wiped off instantly, a permanent mark in the form of a rusty spot is left; the flowers also often become spotted by the damp. With this warmth, refuse tobacco, as before recommended, may be used in the troughs on the hot-water pipes. Roller blinds should now only be lowered for a few hours when the sun is strong. *Oncidium crispum* may be potted during the autumn months.

INTERMEDIATE HOUSE.—*Autumn Temperature.*

The time has now arrived when water should be given with great care, not keeping them very dry at present, for I have at times seen plants so shrivelled from drought as to be beyond recovery, while others frequently come under my notice that are suffering from the effects of too much water (*see remarks on Resting, page 51*). The roller

blind will now be rarely needed, but should not yet be taken down. A fresh supply of leaves should be placed over the pipes or under the stages, as previously recommended; and beware of wood-lice and cockroaches, as they are very troublesome at this season. Ventilate as freely as the outside conditions will admit, and damp down twice a day.

WARM HOUSE.—*Autumn Temperature.*

Let damping down now be done about twice a day, as the air at this season should be kept somewhat drier, the growing period having passed, and this will tend to harden off the growth. I am not advocating such rigorous treatment as for the Mexican Orchids, but that a less moist temperature should be given to others, as well as less water at the roots, and air admitted on all suitable occasions, having a little fire heat to promote a quick circulation and also a buoyant atmosphere, as bracing as possible. With this a healthful tone is given to the plants and is of material benefit to them throughout the winter months. By this means all intermediate second growth is arrested.

NOVEMBER.

COOL HOUSE.—*Autumn Temperature.*

With repotting and top dressing finished, watering of the plants must be done with care, giving only to those which may still be making a little growth, and only now and then to the inactive, sufficient to keep them plump. Now that so little time will have to be spent in watering and damping down, for once or twice a day for damping will be sufficient, according to the fire heat in use, there will be plenty of time for a general cleaning up, washing the pots, thoroughly cleaning the plants, and destroying any insects that may be discovered in their hiding places; the woodwork, glass, and stages must also have attention, clearing away all dirt and rubbish, whitewashing the walls, and making all snug and clean.

Orchids producing flower spikes should be raised above the others by using inverted flower pots, so that they may be easily watched and protected from slugs and other enemies. Let the houses still have plenty of air when the weather is favourable.

INTERMEDIATE HOUSE.—*Autumn Temperature.*

With increased fire heat now, see that the atmospheric conditions of the house have careful attention. Damp, murky weather at this time of the year should be counteracted by just sufficient warmth in the pipes and house to allow air to be admitted through the top and bottom ventilators, both night and day, unless the outside air is too cold or there is the certainty of frost.

In towns where smoke prevails and when there are fogs, it is best to exclude the outside air at such times, seeing that the plants and

atmosphere are not over dry. Afterwards well wash the glass to remove all dirt and to obtain all the light possible, also go over the plants with a sponge to remove the soot, &c., that is deposited on the leaves. Damp down once or twice a day.

WARM HOUSE.—*Autumn Temperature.*

Now that more fire heat will be needed, see that the atmosphere does not become too dry and arid, and damp down about twice a day. I decidedly advocate sufficient rest for the plants, but some cultivators do this to too great an extent. It should not be forgotten that in their native habitats, should it not rain through the dry season, there are refreshing dews at nights which serve to refresh vegetation. Let any cleaning up also be attended to here, as in the other houses, and ventilate with great care.

DECEMBER.

COOL HOUSE.—*Winter Temperature.*

During this month a good amount of fire heat will be wanted, but avoid giving it in excess, tempering it as much as possible by damping the house once or twice a day, as may be thought necessary, and ventilating at top and bottom if the outside conditions admit of this being done, especially on the leeward side, also raise the plants nearer to the glass, and be very careful as to watering.

INTERMEDIATE HOUSE.—*Winter Temperature.*

See that no Orchid overhangs or shades another, studying which place in the house is most suitable for each plant, and when such a place is found, keep it there until the end of the winter or longer. Damping once or twice a day, as may be found necessary, and keep the temperature steady. Many plants in a growing state will still make but little progress, but do not try to force them by giving extra heat; rather be contented to keep in good health the plant as it is. Pleiones may be re-panned or re-basketed and suspended from the roof for a time, and kept moist.

WARM HOUSE.—*Winter Temperature.*

If any ventilation is needed it must be carefully given, avoiding extremes in temperature, and on no account try to force Orchids by a superabundance of heat and moisture. In exceptionally severe weather it is best to keep a covering on the roofs during the night, and removing it if possible during the day. If *Dendrobiums* are particularly wanted in flower by the end of the month, a few of the earliest blooming, such as *Wardianum* and *nobile*, may be brought into more warmth, but it is best for the plants not to do so until the beginning of February. Damp down about twice a day, and do not allow plants in flower to become too dry at the root.

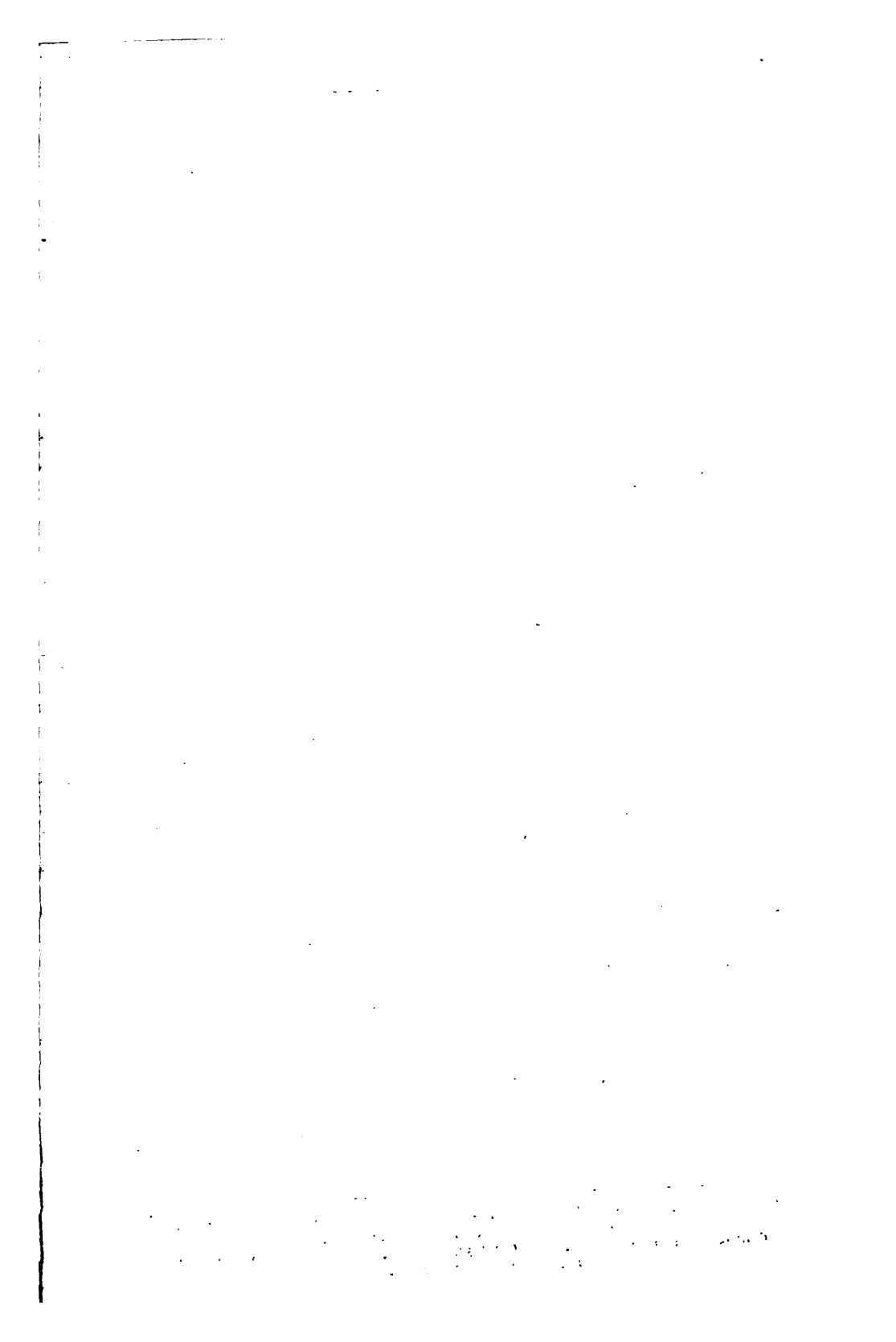


Plate 4.



1—*Dendrobium superbiens*. 2—*Masdevallia towarensis*. 3—*Maxillaria grandiflora*.
4—*Vanda coerulea*. 5—*Laelia autumnalis*.
6—*Odontoglossum Uroskinneri*. 7—*Cattleya maxima*. 8—*Oncidium varicosum*.
9—*Selenipedium* x *Sedeni*.



AUTUMN AND WINTER FLOWERING ORCHIDS.
(SOME OF THE FLOWERS ARE MUCH REDUCED.)

HINTS TO ORCHID BUYERS.

THE prices hereafter quoted are for good strong healthy plants, with full sized pseudobulbs, having (excepting where otherwise mentioned) one good leading pseudobulb or growth.

The terms "newly imported," "semi-established," or "established" refers to the condition in which the plants may be purchased with good results, that which is placed first indicating the condition most to be recommended. Owing to the risks of establishing newly imported plants they can, of course, be purchased at the lowest prices, as, from some cause or another, they occasionally die; semi-established plants command a trifle higher prices; but if the plants are established, and have bloomed, the price is then, in most cases, fixed according to the character or quality of the flower; sometimes this is above and at others below the average newly imported price.

The prices of Orchids often vary from year to year, and are ruled by the quantities imported, but, taken generally, the prices I have quoted will be fair to both the buyer and the seller, in fact, good reliable plants can scarcely be obtained at a cheaper rate, although advertisements sometimes are seen offering "first-class plants" at much lower prices, statements which should generally be accepted with some reserve.

I wish again to refer those who are about commencing to grow Orchids, to my remarks on pages 4 to 9. I know that we all expect to pay for our experience, but it has frequently occurred to me that many amateurs have had to do so *too* dearly, which has led to the cultivation of Orchids being discarded by some.

VARIETIES FOR AMATEURS' SMALL COLLECTIONS.

I PURPOSE giving the names of two dozen species which are good useful kinds for a beginner to start with, and can be cultivated as Cool-house Orchids; following on with the same number for Intermediate-house culture; also twenty-four of the best for a Warm house. Also with cultural instructions for each sort, which, from my own experience, I have found to give the best results.

COOL HOUSE ORCHIDS.

ODONTOGLOSSUM CRISPUM. From Colombia.

(*Syn. O. Alexandræ.*)

This beautiful Orchid is a great favourite, and was re-named in honour of H.R.H. the Princess of Wales, and it is repeatedly referred to under the name of *O. Alexandræ*, by which it is universally known among those amateurs who are not Orchid cultivators generally. Its flowers are white (sometimes rose), marked, more or less, with chocolate blotches, produced on drooping spikes, and when a quantity of plants are grown many varieties are found amongst them, and there are always some in flower, but March, April, and May are the principal months in which they bloom.

Very extensive annual importations of this lovely Orchid take place, so that plants can always be obtained in quantities at a very reasonable price, some of which may prove to be of considerable value, and all are, more or less, beautiful.

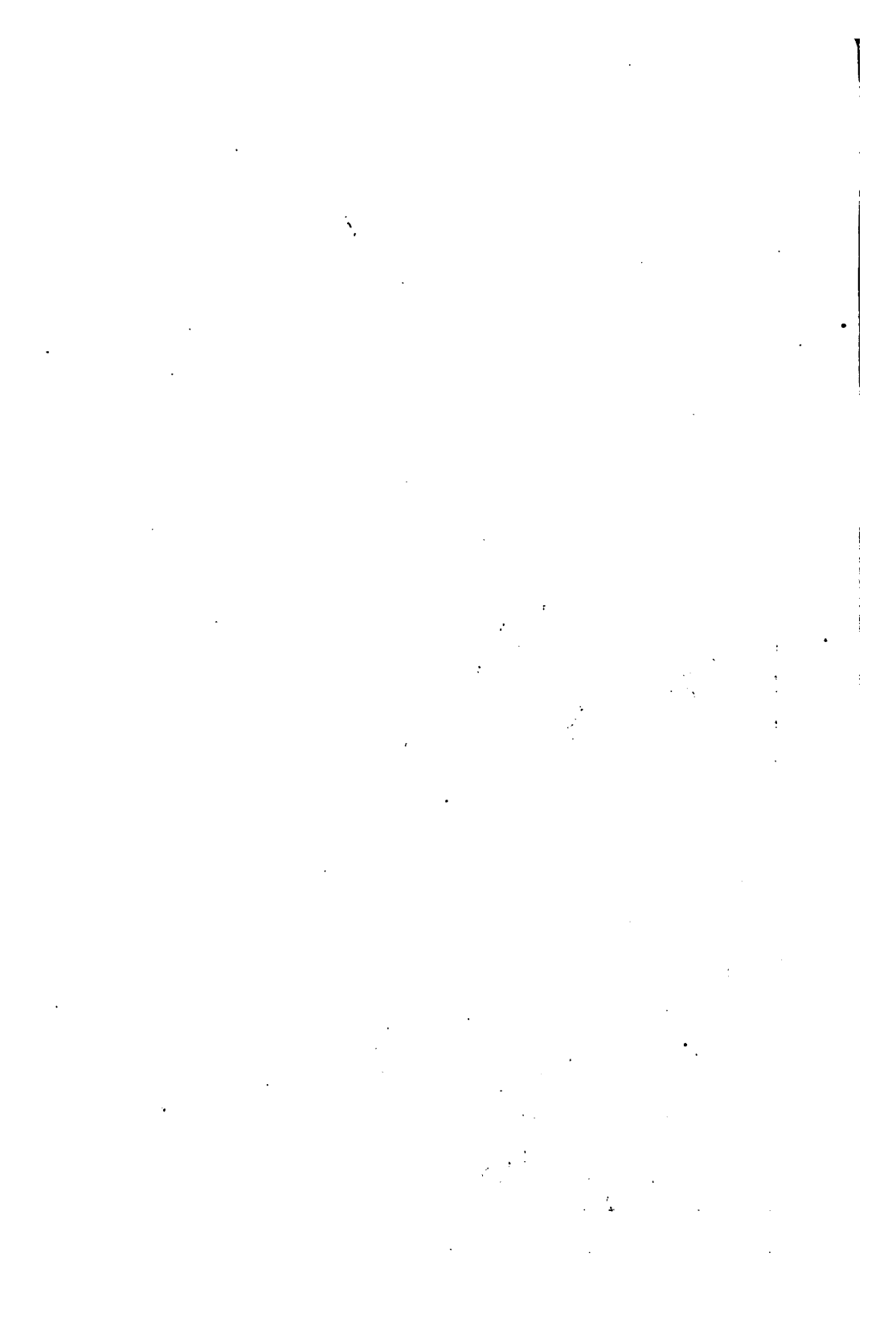
Such a compost as that already mentioned on page 35 should be used, and the plants must not be allowed to become too dry during the summer or too wet during the winter, and must be well shaded from the sun and kept cool and moist during summer, remembering that they do best when the plants are on the stage, but not far from the roof glass.

Repot about once in two or three years, and do it at any time when the new growth is starting from near the base, from March until the following September. Winter potting is not recommended, especially in large towns where the light is not good.

Newly imported or established plants are from 3s. 6d., 5s. to 7s. 6d. for strong leading bulbs.



PARTIAL SPRAY OF *ODONTOGLOSSUM CRISPUM* AND FLOWERING PLANT OF *LÆLIA PURPURATA*.



ODONTOGLOSSUM CERVANTESII. From Mexico.

A very neat and pretty little Orchid, which flowers in the winter and remains in bloom for a very long time, growing best in a small basket or pan suspended from the roof, and in a compost of peat and sphagnum. It never requires resting, but should never be kept soddened at the root; and always let the compost become dry before giving water.

Good newly imported, or semi-established plants, with three or four leading growths, can be purchased at from 5s. to 7s. 6d.

ODONTOGLOSSUM GLORIOSUM. From Colombia.

This is a very free growing and pretty Orchid, resembling in growth the *O. crispum*, and this species is also variable, some being exceedingly sweet-scented, while others have but little fragrance. The colour of the flowers range from a ground work of creamy white to pale yellow, all being heavily spotted and barred with rich brown which varies in intensity. The flowers are smaller than those of *O. crispum*, but the spikes are invariably branched and produce a larger number of flowers; its time of flowering is early spring, and the plants should have the same treatment as that species.

Good plants can be purchased at from 3s. 6d., 5s. to 10s. 6d., newly imported or established.

ODONTOGLOSSUM PESCATOREI. From Colombia.

This is a favourite Orchid, some of which are flowering almost all the year round, and the blooms remain in perfection for a very long time; it is valued for its general beauty and usefulness, and bears its delicate white blossoms on long thin branching spikes; the flowers being irregularly marked with violet coloured spots, and some, purchased as unbloomed plants, are so rich and distinct in the markings as to command high prices. It requires the same treatment as *O. crispum*, and good serviceable plants, with one lead, can be purchased at from 3s. 6d., 5s. to 10s. 6d., newly imported or established.

ODONTOGLOSSUM TRIUMPHANS. From Ocana.

This is a very showy species, flowering in spring, and the flowers are large, of a bright yellow ground colour, heavily marked with chocolate, contrasting conspicuously with the whiter flowers of those already named. There is great variety also in this species, and those which have broad sepals and petals and well formed flowers are always in demand. This plant requires the same treatment as *O. crispum*, and good healthy plants, with one leading growth, should be purchased at from 5s. to 10s. 6d., newly imported or established.

ODONTOGLOSSUM ROSSII. From Mexico.

This, although one of the most common, is a very beautiful dwarf growing species, and is imported in large quantities. The flowers are usually of a white colour, much barred and spotted with brown-chocolate, each spike carrying from two to four flowers, varying considerably on each plant, some being small, others much larger; the flowers being well filled up with bright rich colours. Its varieties, *majus* and *rubescens*, are of greater value, the former being larger and fuller, and the latter being a very dark rose colour. This *Odontoglossum* does best when grown in a shallow pan or teakwood basket, not too large, and suspended from the roof of the house about 12 to 18 inches from the glass. It should have the same compost and treatment as *O. crispum*, but the repotting into pan or basket should be done when new growth commences, seeing that neither are too large for the plant, just leaving a narrow margin betwixt the plant and the outside of the pan or basket. It is a very hardy kind and may be grown in the coolest part of the house, and it is a spring-flowering Orchid and must be watered as recommended for *O. Cervantesii*. Where a number of plants of it are grown, it may be had in bloom from January until June.

Good strong healthy plants should be purchased at from 1s. to 1s. 6d. per leading bulb.

ONCIDIUM MACRANTHUM. From Ecuador.

This Orchid, when in robust condition, is a strong, stately plant, but, like most of the Cool-house *Oncidium*s, the enormous spikes it throws greatly weaken the plant if allowed to remain on it too long, and when it is seen to suffer in this way it is a good plan, in the following year, to pinch out the flower spikes as soon as they appear, thus giving the plant a chance of recovering its strength. The flower spikes of this Orchid grow to a great length, with short flowering branches springing from the main stem, and it is advisable to train it round two or three neat sticks. The colour is golden yellow, with a small portion of purplish brown, and the treatment of the plant should be the same as that recommended for *O. crispum*, but it may be kept at the warmest end of the house.

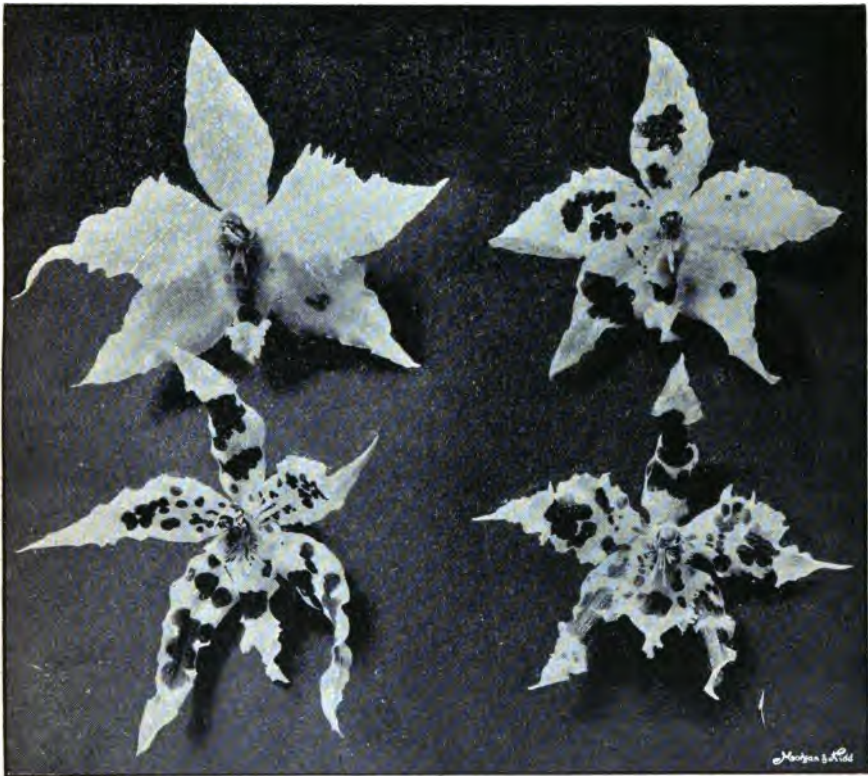
Good strong plants can be obtained at from 5s., 7s. 6d. to 10s. 6d. each, newly imported or established.

ONCIDIUM TIGRINUM. From Mexico.

This is another very strong growing Orchid, having larger and rounder shaped pseudobulbs than the preceding species; it throws branched flower spikes, and the flowers have a beautiful large yellow lip or labellum, the sepals and petals being marked with rich dark

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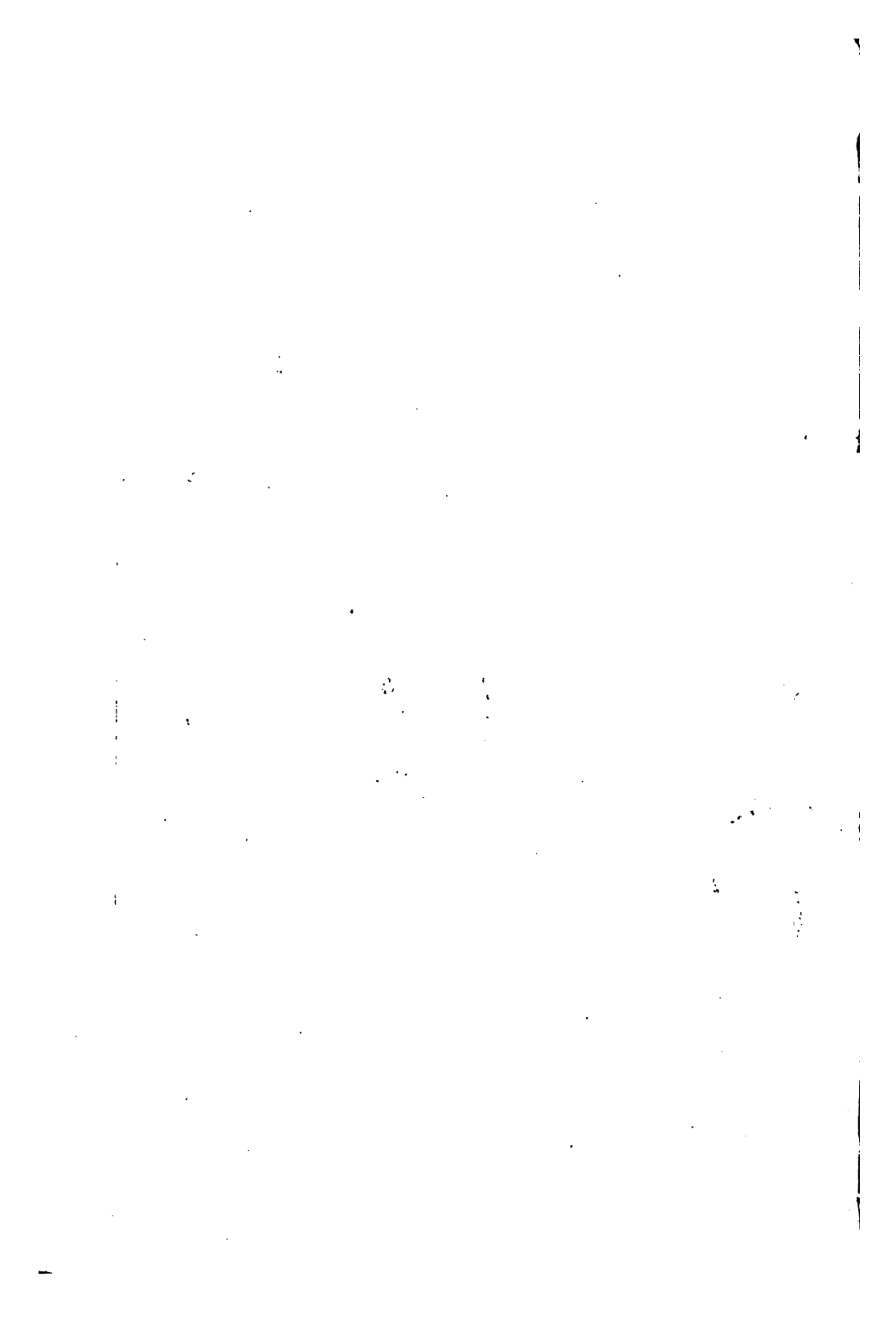


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(From the ORCHID REVIEW.)

4

- 1.—ODONTOGLOSSUM CRISPUM XANTHOTES.
- 2.—ODONTOGLOSSUM x ANDERSONIANUM VAR. ' '
- 3.—ODONTOGLOSSUM x ANDERSONIANUM SUPERBUM.
- 4.—ODONTOGLOSSUM x HORSMANII.



brown spots. It usually flowers in October or November, and has a most pleasing perfume, resembling that of the Wild Primrose. The necessary treatment is that recommended for *Odontoglossum crispum*, but many prefer growing it in a teakwood basket suspended from the roof; but it also conforms readily to pot culture, and its varieties often differ much in the size of the flower, also in shape and brilliancy of colour, and it should be kept at the warmest end of the house.

Good strong plants can be purchased at from 5s., 7s. 6d. to 10s. 6d. per leading growth, newly imported or established.

ONCIDIUM VARICOSUM. From Brazil.

This is another lovely species; the beautiful labellum of which is a rich yellow colour. It has enormous spikes bearing a large quantity of flowers, and when seen in perfection is a most graceful plant. I am, however, unable to recommend it to amateurs so strongly as others, as it sometimes shows deterioration in growth from flowering so freely, still, as it can be purchased at a moderate price, a few plants should be grown, it being easy to give the plant a season's rest from blooming by pinching out the flowers for one year, and so restore it to health again. This Orchid may be grown in pans or baskets, in peat and sphagnum moss. I have also done it well by growing it on blocks of wood suspended flat-wise from the roof, and if apple, pear, or dogwood blocks are obtainable, they are much to be preferred, especially if newly cut and green, with the bark left on, and the plant securely fastened by means of copper wire and copper tacks. If unable to procure these blocks, the next best are small flat rafts made from teakwood, as these resist decay for a long time. Should, however, decay overtake the block, or slimy matter appear, it will be best to remove the plant carefully and place it on a new one. It requires but little water in winter, and when grown on wood there is less chance of its being over watered; care must, however, be taken not to let the plant become dry during the time it is carrying its flower spikes; it should be suspended near the glass. It blooms about November, and after flowering should be at rest until the spring, only giving enough water to keep it in a plump condition. If on a block or raft, water may be given freely, but if in compost, then not so often.

Good plants can be bought at from 5s. to 7s. 6d., newly imported or semi-established.

SOPHRONITIS GRANDIFLORA. From Brazil.

This little gem is a very small-growing plant, requiring a limited space only, and well deserves a place in every Cool Orchid-house; the flowers are generally solitary, and with never more than two on a footstalk; colour brilliant scarlet, and varying in size according to the strength of the pseudobulb, the average width of the flower being

about an inch. It succeeds best grown in small pans or baskets, and suspended near the glass, delighting in shade it should never be exposed to bright sunshine, and thrives best in peat and sphagnum in equal proportions, with a few small lumps of charcoal to keep the compost open and porous. It should be kept moist all the year through, and does best at the warmest end of the house. Its flowering period is from November to March, and good plants, with from four to five leads, can be bought for from 5s. to 10s. each, newly imported or semi-established.

VANDA KIMBALLIANA. From Burmah.

This is a pretty little Orchid, and does well in a Cool house, suspended in baskets where there is plenty of light, having only just sufficient sphagnum moss about the roots to keep it firm in position. The sphagnum should be kept moist, and the roots luxuriate in a moist atmosphere, but during the winter very little water is required, only sufficient to keep them plump and healthy. It flowers during October and November, and the flowers are white with bright rose. It is best wintered in a warmer house.

Good plants, with four or five leads, can be purchased at from 7s. 6d. to 10s. 6d., newly imported or established.

MASDEVALLIA HARRYANA. From Colombia.

These are very variable and rich in colour and of close dwarf habit of growth. Good plants, having five or six leads, 5s. to 10s. each, established. See page 16, "Masdevallias," for culture, &c.

MASDEVALLIA VEITCHIANA. From Peru.

Another pretty showy species, of close dwarf habit of growth, and of a shining yellow colour, beautifully shaded with purple, and of great substance. Its period of flowering is more prolonged owing to its habit of throwing up flower spikes as soon as new growth is matured, whereas, in *M. Harryana*, although continually making growth, it pushes up all its flowers at one time.

Nice plants with from two to five growths, can be bought at from 5s. to 10s. each, established.

M. Veitchiana grandiflora is a specially grand variety.

MASDEVALLIA IGNEA. From Colombia.

A beautiful bright fiery red coloured kind, with the habit of *M. Harryana*, but the colours do not vary so much as in that species, being chiefly from red or orange to bright red.

Nice plants, with from four to six growths, can be purchased at from 5s. to 10s., established.

See page 16, "Masdevallias," for culture, &c.

MAXILLARIA GRANDIFLORA. From Ecuador.

This very pretty Cool-house Orchid is not grown so largely as it deserves. Its predominating colours are white and yellow, and the flowers are delightfully scented, making a charming button-hole flower. This Orchid grows freely when potted in sphagnum and peat, with a little sand and broken charcoal mixed together. The plants should be placed on the stage and have treatment similar to that advised for the *Odontoglossum crispum*. It flowers in the autumn, lasting in bloom for a long time, and under proper treatment soon grows into a large plant. It is advisable to winter this plant at the warmest end of the house, or in an intermediate temperature.

Good plants, with one or more strong leading growths, can be purchased at from 7s. 6d. to 10s. 6d. each, established or newly imported.

EPIDENDRUM VITELLINUM. From Mexico.

This lovely Orchid is a native of Mexico, and is found there at very high elevations, where the atmosphere is constantly moist and cool. The beautiful flowers last in perfection for a long time, and are produced on spikes, which on strong well-grown plants carry upwards of 20 blooms on each, and, when three or four blooms are wired together with fern, are invaluable as button-hole flowers. The colour is bright orange-scarlet, of an uncommon shade. Large quantities of this Orchid are imported annually, and it is evidently very plentiful in its native habitat, and is of easy culture in pots or suspended in pans or baskets, but I recommend pot culture. Potting and treatment of this plant should be the same as that recommended for *Odontoglossums*, only that the coolest part of the house suits it best, for, like *Odontoglossum Rossii*, it will stand severe cold better than many Cool Orchids, and its usual time of flowering is from May to August. The best time for repotting it is March, not allowing it to become dry afterwards, or the flower spikes, which commence pushing at this time, may be weakened. Keep the plants rather dry during the winter or the leaves spot badly.

Good strong plants are obtained at about 1s. 6d. per leading growth, and the majority of the clumps as imported have an average of four to five leads, so that they are serviceable plants to start with, newly imported or established.

DISA GRANDIFLORA (*Flower of the Gods*. It is also known as the *Pride of Table Mountain*). From the Cape of Good Hope.

This is a tuberous-rooted herbaceous Orchid of great beauty when properly cultivated, and is a native of the Table Mountain, at the Cape of Good Hope, and although requiring a somewhat

different treatment to most of the Cool-house Orchids, it is one that I feel constrained to recommend to amateurs, as the treatment required is so simple. It should be potted in chopped fibrous peat, with a liberal supply of coarse silver sand, filling the pots one quarter of their depth with crocks, and placing over them a thin layer of sphagnum, making the tubers moderately firm in the pots, and leaving their crowns slightly below the surface of the soil. The best time for repotting them is in the autumn, immediately after the plants have flowered, when a new growth starts from the side of the old flower spike. During the winter months *Disas* should occupy an airy position in a Cool house, or a place may be found for them with the *Odontoglossums* on a shelf near the glass, at the coolest end if possible, and near to a ventilator. In April they should be removed to a cool frame, having a north aspect, which is, or can be, shaded from the sun's rays, and the plants should be well syringed night and morning and never allowed to become dry. They should also be examined occasionally for red spider and aphids, which sometimes attack the plants. Under such treatment as I have recommended *Disa grandiflora* will grow freely and multiply, and the great beauty of its flowers will be seen from August to October. Keep them just moist only during winter or "rot" will occur. The colour is a rich scarlet, with light markings, and strong plants can be purchased at about 5s. each, established or newly imported.

DENDROBIUM JAMESIANUM. From Moulmein.

There are but few *Dendrobiums* which can be cultivated with much success in a Cool house, but this species is suitable, and when well grown is a stately Orchid, producing fine trusses of large and beautiful white and yellow blooms. The usual compost I have recommended for Orchids suits it, and it can be grown in small baskets suspended from the roof, near to the glass, and have plenty of water when growing, and during the winter it should never be allowed to become dry enough for the pseudobulbs to shrivel, and removed to an Intermediate house.

Strong plants, with one lead, are obtainable for about 5s. to 7s. 6d. each; and, in purchasing this Orchid, it is best to obtain newly imported or semi-established plants, as they start into growth much more satisfactorily than old plants.

CYPRIPEDIUM INSIGNE. From Nepal.

This old species of the "Lady's Slipper" is a great favourite, and is found, like *Ceologyne cristata* and *Dendrobium nobile*, in almost every collection of plants in all gardens of note throughout the country. It should be grown in pots in a compost of fibrous peat, broken charcoal, silver sand and sphagnum moss. The pot should be well



CYPRIPEDIUM INSIGNE SANDERÆ.

(From the ORCHID REVIEW.)

drained to half of its depth, using pieces of broken pots and large pieces of charcoal with a layer of sphagnum over the drainage. In potting, let the compost be well worked in amongst the roots and around them, making it moderately firm, and watering carefully until the plants are established, then they luxuriate—especially in the growing summer season—in a liberal supply of water. It is a very free blooming plant, throwing its flowers in great numbers when the roots are pot-bound, but not so large and of such good quality as when the roots have more freedom, and they do best on the stage, near to the glass, and where there is as much light as possible. The flowers are of a pretty greenish yellow colour with white markings. There are now many varieties of *Cypripedium insigne*, such as *Chantini*, a bold form, and one of the best, and moderately cheap, fully half of the dorsal sepal being white, beautifully spotted with purple. There is also a handsome clear straw coloured variety named *Sanderæ*, but it is exceedingly rare at present.

Strong established plants of this variety (*insigne*), capable of carrying five or six blooms, can be purchased for 7s. 6d. or 10s.; smaller plants can be bought much cheaper.

CYPRIPEDIUM VILLOSUM. From Moulmein.

This is another beautiful Cool-house Orchid, requiring the same treatment as *C. insigne*; it is rich in colour, but of peculiar shades of light and dark rich brown combined with soft green and purple, the flower having a beautiful shining appearance as though it had been varnished. It flowers in spring, and good plants, capable of carrying three or four flowers, can be purchased for 10s. 6d.

CÆLOGYNE CRISTATA. From Nepaul.

This should be in every collection, however small, for it is exceedingly beautiful, blooms very freely, and is so easily cultivated. The flowers are pure white, with a small yellow blotch on the labellum, and are borne on pendulous racemes, with frequently from six to eight flowers on each when the plants are strong. It must, however, be admitted that it seldom flowers so abundantly until the plant has reached a fair size, and it is no uncommon occurrence to see in Orchid houses large specimen plants smothered with flowers, almost entirely hiding the foliage. Small plants will sometimes flower freely, but not in proportion to the old established clumps, which have many more leading growths to produce flowers. Do not, therefore, disturb the specimens unless it is desirable to increase the stock, as considerable time elapses before growth commences, and activity of the pseudobulbs takes place. This is somewhat surprising, seeing that the plant makes so little root compared with many others. It is consequently better not to repot this Orchid until absolutely necessary, which is, when growing

over the side of the pot; when, however, repotting has become imperative, the division of the plant should be avoided as much as possible, as it thrives best when having a mass of bulbs, and it delights in a liberal supply of water during the growing season, but after the growth is completed the plants should be kept in a dry position and in the most airy place in the house, and only a little water given occasionally. A cool, dry greenhouse, with a temperature as low as 40 degrees at night, would suit it during winter. If too much water is given just before the buds appear, the flower spikes are apt to turn black and rot off. The proper compost for this Orchid is sphagnum and peat in equal proportions, and the plants flower in March and April. Manure water may be applied during the growing season, but in a weak form.

Good plants, capable of bearing from four to eight spikes, can be purchased at from 5s. to 10s. each, and large specimens can sometimes be met with at very moderate prices; established.

LÆLIA PRÆSTANS. From Brazil.

(*Syn.* *Cattleya marginata.*)

This is almost the only *Lælia* that will grow well in company with *Odontoglossums*; it is a dwarf-growing species and should be grown in baskets in the usual compost of peat and sphagnum, and suspended as near the glass as possible where there is plenty of light and in the warmest position. It should be kept moist when growing, but after flowering but little water is needed during the winter; its blooming time is usually October. Like other members of this genus it is subject to mealy scale on the rhizomes and pseudobulbs, but this can be kept down by occasionally going over the plants and cleaning it off with a small brush, taking care not to bruise the dormant eyes. The flowers are of a rosy carmine colour, and may be mistaken, as in fact it sometimes is, for *Lælia pumila* Dayana, but *L. præstans* has the boldest flowers, and the lip is deeper in colour and is margined with a white tint. I recommend newly imported or semi-established plants being obtained, as old established plants are not so satisfactory, and it is best to give it a little more warmth during the winter.

The price of plants varies from 5s. to 10s., with from three to five good leads.

ANGULOIA CLOWESII. From Venezuela.

This is a noble free growing Orchid, and peculiarly interesting on account of the bold beautiful yellow and highly perfumed cup-shaped flower, the labellum of which moves up and down in a rather eccentric manner when the flowers are touched, being delicately connected by a thread-like ligament, and is known as the Cradle, also the Tulip Orchid. This plant grows best in a pot, and the compost should consist of two parts of peat, not necessarily very fibrous, to one of

sphagnum; it flowers in May or June, and the plant commences its growth simultaneously with its flowering. Should it be necessary to repot the plant, it must be done when the flower spikes begin to appear, generally in the early part of March, for if left until they are out of bloom both the new growth and the new roots are very far advanced, rendering repotting at that stage both difficult and dangerous. During the growing season water may be given rather freely, but when a new pseudobulb has completed its growth it should have a good period of rest, giving but little water during the winter, and the plant should occupy a position on the stage near to the glass. It is best to give this plant more warmth during the winter if possible.

Strong plants may be purchased at from 10s. to 20s. each, established or semi-established.

ADA AURANTIACA. From Ocana.

This Orchid is recommended on account of its beautiful orange coloured flowers, many of which are produced on each spike; a few plants in flower being very effective when arranged with other Orchids. It flowers during the early spring months, and requires the same treatment as the *Odontoglossums*, though probably a little less water is required during the summer months, and it should occupy the warmest end of the house, as its leaves become spotted on the under surface if the temperature falls very low, and this should be avoided if possible, as such a check often produces disease, seriously injuring and occasionally causing the loss of the plant.

Good plants, which under generous treatment soon grow into good specimens, can be purchased at from 5s. to 10s. 6d. per two or three leads.

TWENTY-FOUR ORCHIDS FOR AN AMATEUR'S
INTERMEDIATE HOUSE.

All Cheap, Beautiful, and Easily Grown.

CATLEYA DOWIANA AUREA. From Antioquia.

This is the most beautiful of all the *Cattleyas*, having rich golden-yellow flowers, with lovely purplish crimson veined markings on the lip—a charming and attractive combination of colours. It requires a little more warmth than most of the other species, but the beauty of the flower amply repays a little extra trouble; and, if available, a position near the glass and immediately over the end where the hot-water pipes enter the house, would suit it admirably during the growing as well as the resting season. This grand Orchid should be

repotted into pots or baskets, in fibrous peat and sphagnum, about March or April, as it then commences to grow and push out new roots. Water moderately at first.

All through the summer months, while the new pseudobulbs are in course of formation, the plant should not be allowed to suffer from drought, but watered when the compost assumes a whitish appearance. When the new growths have reached their normal size, the bloom buds begin to form and push by degrees from the sheath, and open during the months of September and October. But, like some others, this Orchid will occasionally push up its flowers from the apex of the pseudobulb without the presence of the sheath; whilst, on the other hand, a sheath may be formed and a flower fail to come. But these are exceptions and not the rule. It sometimes happens that autumn-flowering Cattleyas, instead of pushing up their flowers, start a young growth from the base of the newly-formed pseudobulb, and in such a case I always pinch off the new growth to induce the flower to form and open in due course. If, instead, the young growth is allowed to remain, it rarely develops a full-sized, strong pseudobulb, and the autumn is far advanced before the growth is even matured, and all hope of seeing the bloom grow and expand may be abandoned. After flowering very little water is required, only enough to keep the bulbs and leaves healthy and plump; probably once a week will be sufficient, always taking care that the plant is in a warm and dry position during winter. When the flower spikes have been cut, the sheath should be entirely removed by pulling them clean away from the pseudobulb, and the spikes also cut out close to the pseudobulb, and all danger of damping or decaying will thus be arrested.

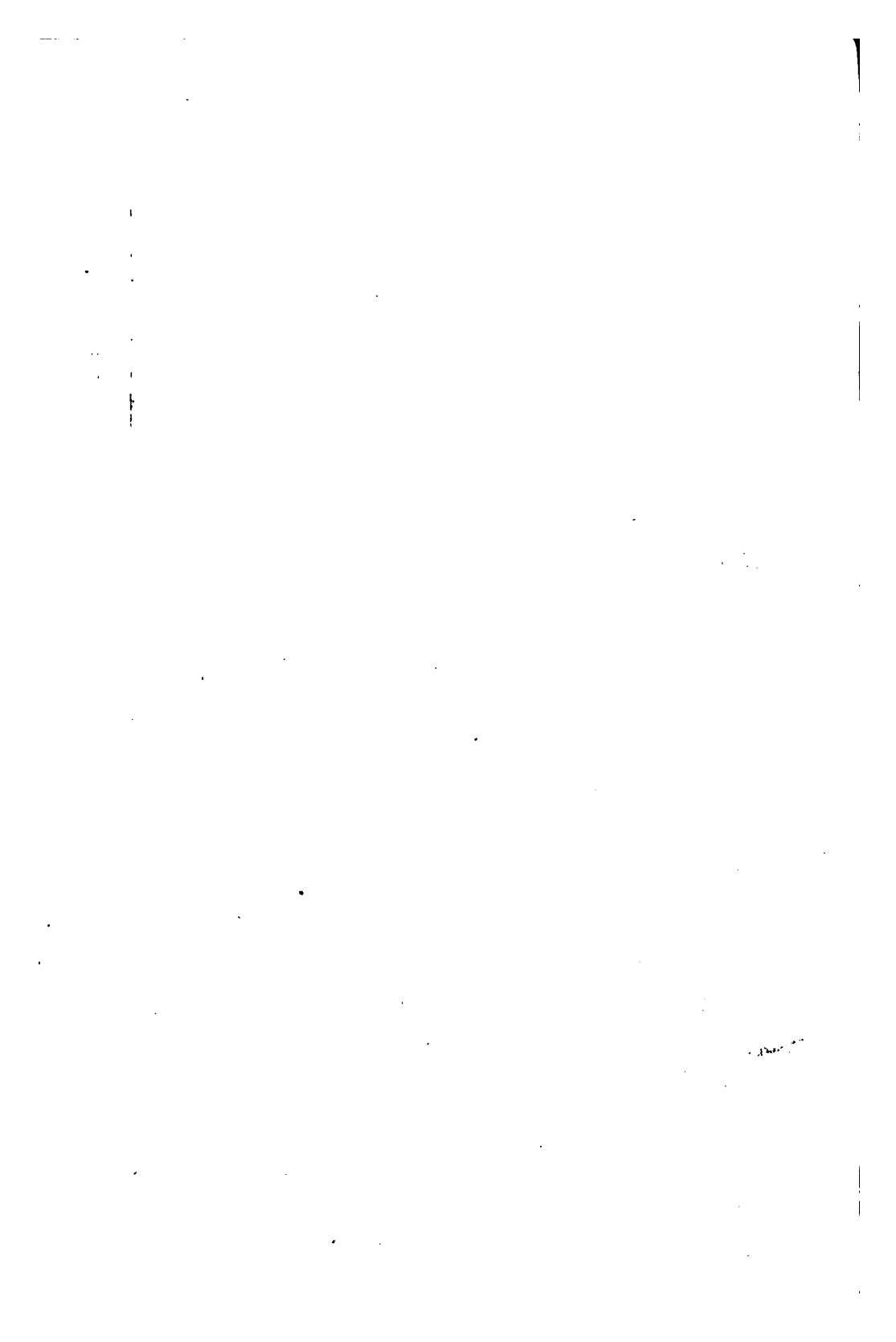
Strong plants, newly imported or established, at from 10s. to 20s.

CATTLEYA GASKELLIANA. From Venezuela.

This is a late summer blooming species, producing its flowers during the month of August and the early part of September, and should be potted in March, just as they commence making their growth, or may be left until after the plants have flowered. Fibrous peat and sphagnum in equal proportions, with a little broken charcoal mixed in suits this and all other Cattleyas, and the pots should be well drained half their depth, placing large crocks at the bottom, and smaller with some charcoal over them. Cattleyas should be potted moderately firm, bringing the new compost well to the base of the pseudobulb, and, when potting is completed, should any portion sway, steady it by tying the pseudobulbs to neat sticks, it being so necessary to the roots when pushing to take a firm grip of the compost, which is prevented if the plant is unstable. There are numerous varieties of *C. Gaskelliana*, varying more or less in shades of colour and markings, light tinted forms predominating, so that the darker varieties are in



SPECIMEN PLANT OF CATTLEYA MOSSIAE. WITH SINGLE FLOWER OF ONE OF ITS VARIETIES ON THE LEFT.



greater demand; also those which are almost white, but very few pure white forms have yet appeared. These can all be grown in pots or baskets, and should have a position where there is much light, but shaded from the hot sun. This is a somewhat plentiful species, and good strong plants can be bought for 2s. 6d. per leading growth, so that plants suitable for a 32-size pot with three or four leads may be bought for about 10s. 6d. Watering should be attended to as recommended for *C. Dowiana aurea*, and a good supply given when the plant is growing, but only sparingly when at rest. Newly imported or established.

CATTLEYA WARSCIEWICZII. From Antioquia.

(*Syn. C. gigas.*)

This is another superb summer-flowering species, blooming immediately the pseudobulb is formed, and some of its varieties, known as *Sanderiana*, *Imperialis*, *Burfordiensis*, &c., have blooms of a great size and brilliancy of colour, but, if recently imported, these varieties cannot be determined until they have bloomed. Imported plants of this splendid Orchid are sometimes sold by auction under the name of *C. Sanderiana*, but, as previously stated, their identity cannot be established until they are in flower. There are varieties of this species which are naturally shy bloomers whilst others flower very freely, but whether shy blooming or otherwise they flower much more abundantly if grown near the glass, and almost fully exposed to the sun's rays, only shading them when the sun is intensely hot and bright. This species can be grown in pots or baskets, in peat and sphagnum, and are best repotted either in March, just as they commence growing, or in the summer, immediately after flowering. I prefer summer potting, as then the new pseudobulbs push out a number of fresh roots which continue growing more or less through the winter, and the plants at this stage become quickly re-established in the new compost. There is some danger of this species starting into growth again, more especially if the pseudobulbs do not bloom, and it is not always possible to prevent this, but it can generally be avoided by reducing the amount of water and giving the plant an airy and dry position throughout the remaining summer—the coolest in the house, near to a ventilator, if possible, or it may be placed in an early peach-house, or early vinery, after the fruit has ripened, and the trees are at rest—and restored to their proper quarters by the end of October. There they should remain dormant until March, giving them very little water, and even when they start into growth in the spring water should be given very sparingly until the new growth is about two inches long, but after that more freely, remembering that if too much water is applied at the early stage of growth the chances of the plant flowering freely are greatly reduced. The colour of this species is of a beautiful

rose tint varying in intensity, the lip is very handsome, being much darker, with a large yellowish blotch in the throat.

Good plants can be obtained, with one or two leading growths, at from 5s. to 10s. 6d. each, newly imported or established.

CATTLEYA LABIATA. From Brazil.

This, also, is a beautiful and useful species and a very free bloomer, opening its lovely blossoms during October and November. It is a very old introduction, having been brought into this country in 1818, but until within the last five years it was rarely seen in flower, and this is accounted for by the original importations being so very small. For many years no plants of this species reached this country until when recently re-discovered and introduced in very large quantities; while, owing to its scarcity previously, it is looked upon as a valuable addition to this grand labiata section of Cattleyas. There is great variety amongst them—some being small and deficient in colouring, the flowers of others being as large as *C. Warscewiczii* and dark mauve in colour, with the lip of a rich purple tint. Strong plants of this species may be purchased at from 5s. to 10s. 6d. each, with from one to three leading growths—plants which four years since would have cost from £40 to £50. It is best grown in pots or baskets, and occupying a position where there is plenty of light. Its treatment should be the same as that advised for *C. Gaskelliana*. Newly imported or established.

CATTLEYA MENDELII. From New Granada.

Another variable family of great beauty, having very large, handsome, and often exceedingly delicate tinted blooms, the sepals and petals frequently being of a light pink shade of colour, often approaching to white. It flowers during April or May, and does best when grown in peat and sphagnum, either in pots or baskets, in a light position near the glass, and should be potted immediately after flowering only. For general culture and treatment, see that recommended for *C. Gaskelliana*.

Good plants can be obtained at from 5s. to 10s. each, newly imported or established.

CATTLEYA MOSSIAE. From Venezuela.

This, also, is a very beautiful Orchid, and richly deserves a place in every collection, the labellum or lip is so richly and beautifully coloured, while the plant is of easy culture and blooms very freely from April to the end of June. It should be potted immediately after flowering into pots or baskets, using peat and sphagnum, watering freely during growth. It is advisable to keep it moderately dry whilst at rest; but, like others, must not become thoroughly dry when in flower or when it is growing. Good plants, with from one to four breaks, can be purchased at from 3s. 6d. to 10s. 6d. each. As with



CATTLEYA SCHROEDERÆ.

other species of *Cattleyas*, there are several varieties, many of them distinct and richly deserving a place in every good collection, especially such as *C. Mossiae Wagneri*, pure white with an orange blotch in the throat; *C. Mossiae Reineckiana*, with pure white sepals and petals, and richly marked lip. These *Cattleyas* should occupy a position near the glass, and be potted only immediately after flowering. For general treatment, see *C. Gaskelliana*. Newly imported or established.

CATTELEYA TRIANAE. From New Granada.

This species is one of the earliest to flower, commencing in January and continuing through February and March. The good varieties of this species are equal in size and beauty to any of the *C. labiata* section; but there are a large portion of the varieties with smaller blooms, and although all are very pretty and their colours varied, from delicate pink to rich dark rose, they are not equal in size and form to others of the *labiata* section. There are also several named varieties of this species, such as *C. Trianae alba*, with pure white sepals and petals with yellow on the lip, which is an expensive variety; but plants are sold under this name which are not pure white but have a faint tint of pink colour, this colouring matter varying according to the season, sometimes almost pure in colour, at other times the rose colour is more noticeable, and occasionally more like a variety sold under the name of *Cattleya Trianae delicata*. As this species comes early into flower, it also commences making new growth, and matures sooner than *C. Mossiae* and *C. Mendelii*, and like *C. Warscewiczii* (*syn. gigas*), it is best to be watchful, to prevent a second growth. Pot after flowering only. For other treatment, resting, &c., refer to *C. Gaskelliana*, page 92.

Good plants of this species can be purchased at from 5s. to 10s. 6d. for plants with from one to three strong leads, newly imported or established.

CATTELEYA SCHRÖDERÆ. From New Granada.

I have already given a long list of varieties of the section *C. labiata*, but cannot omit mention of this beautiful kind, which is distinguished from the other species on account of the flowers being more constant in form and colour, and although varying in hue to some extent, scarcely ever assume the wide differences in colour and form so characteristic of the other species. The flowers are of a beautiful and uniform delicate rosy blush tint with a large blotch of orange-yellow in the throat; a lovely and chaste variety, and should be included in every collection. In growth it much resembles *C. Trianae*, and can be grown in pots or baskets, having the same treatment as recommended for that species.

Good plants can be purchased for from 5s. to 10s., with from one to three strong flowering leads. Newly imported or established.

CATTLEYA LODDIGESII. From Brazil.

A very pretty species, and one which well deserves a place in all collections. In habit it differs from the foregoing, but requires exactly the same treatment, and it may be grown in either pot or basket, but owing to the pseudobulbs growing longer than others, it is most adapted to pot culture. It should be repotted in early spring, just as the new growth and roots push forth. It flowers from August to October, lasting a long while in perfection, the spikes bearing flowers according to the strength of the plant, and are of a rose colour, with a small blotch of light yellow on the lip. A variety known as *C. Harrisoniæ* is very similar to this species, the flowers being darker in colour with the blotch on the lip of an orange colour. Peat and sphagnum is the best compost in which to pot this plant, and as to general treatment, see that recommended for *C. Gaskelliana*, giving it a position where it can have plenty of light.

Good plants of this species should be bought for about 5s. for one or two strong leading growths. Newly imported or established.

CATTLEYA CITRINA. From Mexico.

This is totally unlike any other species of *Cattleya* in growth and habit, and is one of the very few Orchids which I recommend for block culture because of its habit of growing downwards, the pseudobulbs, foliage and flowers always drooping towards the ground. If the plants when first received from the importer were placed on a block or in a pan in an upright position—which to an inexperienced person amongst Orchids may be thought to be its natural one—the first new growths formed would turn and grow in an opposite direction. This Orchid appears to be most plentiful in its native habitat, as it is imported in large quantities, and this is a very fortunate circumstance, for without new supplies it would in a few years become very scarce, as it is one of those kinds which deteriorate after about the third year. Some growers cultivate it better than others, and keep it in good condition a longer time, but I have never heard of any one hitting upon the exact treatment that would keep the plants in a permanently flourishing condition and give an increase in size. It is a handsome Orchid, well worth growing and renewing the stock occasionally. Suspend it in a light position and water when dry by dipping the block and plant into water for a few moments, once every evening if the weather is very dry or hot, and keep at the warmest end of the house in winter time. The flower is of a beautiful bright yellow colour, deliciously fragrant, and the plant always grows actively during the winter, flowering from April to June, and when in flower should be watered without immersion or the flowers will at once decay.

Nice little clumps range from 2s. 6d. to 10s. 6d., for from one to three leading growths. Newly imported in spring.



CATTLEYA MENDELII, A GOOD SPECIMEN.

(From the ORCHID REVIEW.)

CŒLOGYNE MASSANGEANA. From the East Indies.

This is a free growing Orchid and very floriferous when the plants are strong, producing its spikes freely. It should be grown in peat and sphagnum, and is best suited for a basket plant, as the flowers are borne on long pendulous spikes from 12 to 24 inches long, sometimes bearing as many as twenty-four flowers on one spike, and when these are drooping over the side of the basket the plant has a very pleasing appearance, although void of any brilliancy of colour—light yellow and brown predominating. This Orchid should have liberal supplies of water when actively growing, and when inactive it should be kept moderately dry, but never dry enough to cause the pseudobulbs to shrivel.

Good plants should be purchased at from 5s. to 7s. 6d. per strong leading growth. Established.

CYMBIDIUM EBURNEUM. From the East Indies.

Another free growing Orchid, and, like the last named, it soon grows into a large specimen when the surrounding conditions are favourable, and when they become large plants they flower much more freely than when small. It is best grown in pots, in very fibrous loam and lumpy but not necessarily very fibrous peat in equal proportions, intermixed with sharp silver or river sand and a little finely broken charcoal to keep the soil sweet and porous. The pots should be a third full of drainage, and not too small, for if the large fleshy roots of this species are too cramped it is impossible to work the soil down between them, and they must be made moderately firm, otherwise the roots will be crowded into the pots in a mass with no soil worked in between them, but only about them, in which case they invariably rot. The surface of the soil should not be above or even level with the rim of the pot, as is recommended for epiphytal Orchids, or the water runs off instead of into the plant. There should at least be half an inch of space below the rim to receive water. The flowers are borne singly or in pairs, and are a beautiful pure white, with a slight streak of yellow on the lip, and are very sweet scented. It should be watered only when dry, like an ordinary plant, and will succeed best in a cool, shady part of the house, where, if due attention is given to the watering and potting, it soon grows into a good specimen plant, and the stronger the growth the more freely it flowers.

Good plants, capable of producing from three or four flowers, can be purchased at from 10s. to 20s. Established.

CYPRIPEDIUM × HARRISIANUM. Garden Hybrid.

A very free growing and floriferous Lady's Slipper, which should be potted as recommended for *Cypripediums* (see page 35), and given a place in a somewhat shady and moist part of the house. It delights in

plenty of water at the root during the summer, but during the winter months it must have only a moderate supply, yet never allowing it to become too dry. In the flower there is a mixture of rather dark colours, claret and dark purple predominating, and it is a hybrid between *C. villosum* and *C. barbatum*, the flowers having the glossy surface found in *C. villosum*, and is in flower during the summer months.

Strong plants should be bought at from 5s. to 7s. 6d., capable of bearing one or two flowers.

CYPRIPEDIUM SPICERIANUM. From Assam.

This, also, is a very pretty species, and was, until recently, very rare and expensive, but lately, owing to large importations coming to hand, it can be purchased at a moderate price. It requires exactly the same treatment as the foregoing *Cypripedium*, and, like that species, cannot bear strong sunshine. The beauty of the flower is chiefly in the dorsal sepal, which is for the most part white, with a purple stripe running through the centre, the petals of a greenish colour, and the lip or pouch brownish purple, and it flowers from October to December. Some cultivators habitually grow this species in a very cold place, but I have found it to do best in the Intermediate house. It is not, perhaps, such a free grower as some, and does not grow into large specimens so rapidly, but, with proper attention, is not at all difficult to cultivate.

Good serviceable plants should be purchased at from 5s. to 10s., capable of bearing two or three flowers. Established.

ODONTOGLOSSUM CITROSUM. From Mexico.

(*Syn. pendulum*.)

This is a beautiful Orchid and should be grown by everyone, its cultivation being so easy when rightly managed. It should be grown in pans or baskets, in one part sphagnum and two parts lumpy peat, and made secure from shaking about until it has rooted firmly, and the pans or baskets suspended from the roof. This Orchid suffers much from being disturbed, therefore it should not be shifted into larger pans or baskets more than once in three or four years, supposing the leading pseudobulbs are not growing over the side. After it has been shifted into a larger sized pan or basket, it should be kept in a shaded place until re-established to some extent, and during its growing season in summer it should be kept moist at the roots until its growth is completed (and this will be about October), after this it should be gradually dried off by giving a lesser supply of water, until about the end of November, keeping it very dry during the remaining part of the winter in order to ensure flower spikes, which grow from the centre of the young growth in March and April. If the plant is kept moist from November until March, probably no flower spikes will appear. It should be allowed to get dust dry before giving it water, even if the

pseudobulbs shrivel a little, as this will do no harm providing excessive shrivelling is avoided. It is difficult to state exactly how often to water this Orchid when resting as so much depends upon the state of the weather, sometimes once a week will suffice, at other times once a fortnight. It should be grown at the coolest end of the house and will enjoy as much light as *Cattleyas* generally require, too much direct sunlight upon the plants being most fatal to them. Supposing the new pseudobulbs to be of a fair average size the plant may reasonably be expected to flower with such treatment, and the spikes will, as before stated, appear from the centre of the young growth about April, and these should be protected from slugs or woodlice by wrapping a piece of cotton wool round the growth, after the spike has appeared the plant may gradually receive a larger supply of water; should the spikes not appear, however, by the end of April, and the tips of the new leaves become visible, with the new growths extending, it shows that in all probability there will be no flowers that season, and the plant may then be watered and grown on accordingly for another year. The flower spikes should not be tied in an upright position to sticks, but allowed to take their own course and drooping downwards; the colour is white, more or less tinged with rose, and varieties frequently produce blooms with the lip of a beautiful dark rose colour.

Good plants of this species should be purchased at from 3s. 6d., 5s. to 7s. 6d. per leading bulb for newly imported or established plants.

DENDROBIUM THYRSIFLORUM. From Moulmein.

There are not many of the family of *Dendrobes* which can be said to grow thoroughly well in an intermediate temperature, this however is one of the exceptions, but, coming as it does from a hot climate, it should be placed at the warmest part of the Intermediate house. It is generally grown in pots, and can also be cultivated in baskets, but is an Orchid which does not like disturbance at the root, still repotting becomes necessary sometimes, it being safer to err on the side of repotting too often than to allow the roots to perish in decomposed material. It should be potted in good fibrous peat and sphagnum in equal proportions, half filling the pot with drainage, potting moderately firm but not to cover the base of the pseudobulb, yet bringing the compost well up to the base, so that the young roots enter the compost when immediately pushing into growth. When repotting, all dead or decaying matter should be removed from the roots, and the live roots carefully handled and evenly distributed in the new pot. This operation should take place in spring, directly the plants have finished blooming, which is generally in April, after which time the plant should be encouraged as much as possible to make new growth by being placed in a shady position and very gently damped

over with a syringe once a day. The new compost must be kept just moist only, and on no account should it become saturated until the summer is further advanced and active growth sets in. It is always an important point in repotting Orchids to use a few neat sticks firmly fixed into the crocks, to which some of the pseudobulbs can be tied, in order to make the entire plant secure and not shake about in handling the pot, or it does not readily get re-established. This Dendrobe does not last long in flower, but the grower is amply compensated by the great beauty of the flowers, which are white and yellow, and borne on drooping racemes. When in a growing state this plant requires a reasonable amount of water, and as it is an evergreen kind it does not require so much rest as most of the other kinds of Dendrobiums during winter, and when kept in a dry state it should never be allowed to shrivel on any account, and kept at the warmest end of the house and well up to the light. Yellow thrip are sometimes troublesome on this species, but may be kept down by sprinkling or puffing tobacco powder down the new growths and over the foliage, and should they make too much headway, then resort to fumigation also. Although this species grows well in this house, it also does well in a Warm house.

Good established plants of this Orchid should be purchased for about 5s. per leading growth, but I recommend purchasing newly imported plants which have arrived in the spring, such plants are likely to give much greater satisfaction, and they should then be purchasable in extra strong pieces at from 3s. 6d. to 5s. per leading growth.

LELIA ANCEPS. From Mexico.

This is a very lovely and easily cultivated Orchid which comes into flower in November and December, producing freely flowers of a charming rose colour, with the labellum richly coloured and much darker than the sepals and petals—in short, the colour varies from light rose to very dark rosy crimson, and the most valuable of the varieties, excluding the white, are those which are very dark in colour.

This Orchid may be grown in pots on the stage or in baskets suspended from the roof, and they should be repotted during the month of March, using peat and sphagnum in equal proportions, first half filling the pot with drainage and keeping the compost moist, but not too wet, for about five or six weeks afterwards, when they can be watered more freely; in fact, well soaked by dipping in the tank, especially when the sphagnum has a whitish appearance. When the growth is finished in the autumn, watering may be again reduced, but the plants must not be allowed to suffer from drought until they have finished flowering, then only enough water is required, until March, to prevent shrivelling.

If it is possible to give a small portion of the house full sunlight by not shading it, but not allowing other plants to suffer, this Orchid



DENDROBIUM THYRSIFLORUM.

ORIGINAL ARTICLES

1. *Observations on the Pathogenesis of the Common Cold* 1

2. *The Effect of the Common Cold on the Immune Response* 1

3. *The Effect of the Common Cold on the Immune Response* 1

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39. *The Effect of the Common Cold on the Immune Response* 1

40. *The Effect of the Common Cold on the Immune Response* 1

really thrives better if fully exposed to the sun with plenty of air than it does when too much shaded, and it also flowers more freely. Plants may be purchased either established or newly imported, but I prefer the latter, always selecting those masses which have good foliage, for a loss of leaves means a proportionate loss of strength, which materially affects the vigour of the plant when making new growth. When repotting newly imported plants a large portion of their roots should be rather severely cut away—of course using discretion in doing so—as they only take space which good compost should occupy, and in a short time would become a mass of wet and cold decomposed matter.

Plants may be purchased for about 3s. per leading growth, or about 10s. for masses having probably five or six leads.

LÆLIA AUTUMNALIS. From Mexico.

This is another very pretty species and of very simple culture, but it has a reputation for deteriorating, which is certain to follow if wrongly cultivated, whereas, if hardened at the proper season, it will last in good condition as long as any other Orchid and flower as freely. It flowers in November and December, is very similar in habit and general requirements to *Lælia anceps*, and if treated in the same way will take no harm. I would advise, however, that it be always grown in a hanging basket near the glass, giving the plant the full benefit of the bright sunshine whenever possible. After the flowering an absolute rest should be given, but not so as to cause shrivelling, and at that period it is capable of withstanding a low degree of temperature.

Plants should be purchased at about the same price as quoted for *L. anceps*, but good newly imported plants with good foliage are best.

LÆLIA PURPURATA. From St. Catherina.

This is a noble growing and fine Orchid, in appearance very much like a *Cattleya*, indeed, there is so little difference between *Cattleyas* and *Lælias* as to sometimes cause surprise that they are not included in one group. There is, however, a botanical distinction, consisting of the *Cattleya* having four pollen masses, while the *Lælia* has eight.

This species (*L. purpurata*) is best grown in pots half filled with drainage, and potted in peat and sphagnum in equal proportions, and after being repotted it is apt to shrivel a little, but with just ordinary care it soon becomes re-established and grows very freely. No better place can be found for this plant than on the stage and well up to the light, watering and treating exactly the same as a *Cattleya*. It differs slightly, however, inasmuch as it is rarely ever at rest, growing during winter as well as in summer, and has therefore no definite resting season. Its time of flowering is May or June, and the varieties vary very much in colouring, some being particularly dark and others almost a pure white, all being well worth growing.

This species may be purchased either as newly imported or established plants, but a nice healthy established plant is perhaps to be preferred, as, unless *Lælia purpurata* is imported in first-rate condition, a year or two must elapse before strong flowering growths can be made. On the other hand, newly imported plants can be purchased at a much cheaper rate. Healthy established pieces should be obtained for from 5s. to 7s. 6d. per strong healthy growth, whilst newly imported pieces can usually be bought for 3s. to 5s. per leading growth.

LYCASTE SKINNERI. From Guatemala.

A very lovely winter-flowering Orchid, the flowers of which are of large size, of a thick wax-like tendency, and are borne on erect footstalks. There is considerable variation in the colouring, the light or delicate forms being mostly admired, the sepals and petals of which are of a beautiful blush white. *Lycaste Skinneri alba* is a pure white variety and very handsome, and much more expensive on account of its rarity. *L. Skinneri* should be grown in pots half filled with drainage, using peat and sphagnum in about equal parts, and although I do not recommend a bad quality peat to be used, still it need not be of the best fibrous quality for this species. The plants should be repotted in early spring, only doing this when really necessary, say once in two or three years. Some growers use a little fibrous loam in the compost, which may do good, but, generally speaking, I do not regard it as necessary, success in cultivation depending in a much larger degree—as with all other Orchids—upon temperature, atmosphere, watering, and general attention.

I have found that every care must be exercised in watering this species, and it is much safer to give too little than too much moisture, even when the plant is in active growth during the summer watering must be very carefully done so as not to get the compost soddened, which causes spot to appear both in the leaves and pseudobulbs, and this is generally known as disease.

Established plants, if healthy, of this species may be purchased, but those which prove most satisfactory are newly imported or semi-established plants, as they always grow more freely. The flowers appear from the base of the newly made pseudobulb during the autumn or early winter months, according to the health or strength of the plant. This is a deciduous species, losing its leaves in early spring.

Plants may be purchased from about 3s. to 5s. per leading growth.

MILTONIA VEXILLARIA. From Antioquia.

(*Syn. Odontoglossum vexillarium.*)

This, when well grown, is one of the most showy and beautiful of Orchids, and if cultivated under proper conditions makes rapid growth; with unsuitable treatment it presents a very unsatisfactory appearance.

In the Intermediate house, however, it grows without difficulty, and it should be repotted after flowering, generally about the end of May, and once in two years is often enough for doing so, taking care not to over pot. After repotting, water very carefully, keeping the compost just moist and the plants a little more shaded for five or six weeks, after which water may be applied with greater freedom; although, as in the case of *Lycaste Skinneri*, it is always best to have the plant kept in too dry a condition rather than too wet, especially during winter, and should there be any doubt as to the plant wanting water, wait a day or so until quite sure on this point. The points of the leaves of this species have a peculiar habit of decaying, especially under wrong treatment, either from being too wet at the roots or from too cold a temperature, and this indication commences at the apex by the formation of a watery spot, which should be pierced with the point of a knife, or cut clean away, otherwise it extends in a downward direction. The yellow thrip is a natural enemy to this plant, and if allowed to ravage unimpeded soon work great destruction, but they are easily exterminated by dusting tobacco powder down the axils of the new growth. It thrives best when grown in pots, which should be placed on the stage at the warm end of the Intermediate house and well up to the light, or it may also be suspended in a light and airy position, but not in a direct draught from the ventilator, but where there is a free circulation of pure air, with treatment as before recommended, then free growth is generally assured to this beautiful Orchid.

The best potting material is sphagnum moss and fibrous peat, in equal proportions, with a small quantity of small broken knobs of charcoal mixed in. A variety named "*rubellum*" has small flowers and blooms at a later date, but is by no means so pretty as the original species, *M. vexillaria*, which also varies in form and colour in different plants; the almost white, as well as the darkest and richest coloured, being the most valued. A little weak manure water is beneficial.

This plant is best purchased in an established state, as it is found difficult to import it in good condition, and two years are generally required to get such plants established.

Good strong plants can be purchased at from 5s. to 7s. 6d. per leading growth.

SOBRALIA MACRANTHA. From Guatemala.

This is a very handsome free growing species, and a healthy plant, properly treated, soon grows into a large specimen, producing a number of flowers. It is best grown in a pot, which should be drained with rough crocks to one-third of its depth, and over this a thin layer of sphagnum, and good strong turfy loam, adding a little coarse sand and broken charcoal, to ensure a porous compost and drainage. It should be potted as recommended for *Cymbidium eburneum*, leaving

the surface of the soil one inch below the level of the pot to provide for a thorough watering, and, in potting, the compost should be made moderately firm. This plant is always in a growing state, therefore, has no resting season, and simply requires a good watering when it becomes dry, as with an ordinary greenhouse plant. It should be kept in the coolest part of the house, well up to the light when it can receive a good supply of air. The *Sobralia* flowers during May and June. Each stem, which is rather tall growing, bearing in succession from five to eight beautiful large rosy purple-tinted flowers, and the plant does not need repotting until the pot becomes overcrowded with roots, then it should be turned out and all the old crocks removed, together with as much of the soil as can conveniently be taken away without disturbing the roots, and then repotted into a larger pot, and when the plant is re-established a little weak manure water is beneficial.

Established plants of this species should be purchased at from 10s. to 21s. for two or three flowering stems, although plants of this size may not be plentiful.

THUNIA MARSHALLIANA. From the East Indies.

This is another handsome free growing Orchid, bearing a large truss of beautiful white and yellow flowers at the top of the new pseudobulbs in June and July. This species has a very short season of growth, and should be cultivated in pots half filled with drainage and potted in a mixture of peat, loam, and silver sand, and the compost left quite half an inch below the rim of the pot. The proper time for repotting the plant is the beginning of March, but very little water will be needed until the new growths are about six inches high. Afterwards watering only moderately, in order to keep the pseudobulbs dwarf and to ensure free blooming. They are best grown in small pots. I always place four bulbs in a 32-sized pot, making each one firm with a stick, for the roots which have decayed are trimmed off close, so that there is nothing to hold the bulbs firm without a little assistance, and, after potting, the plants should be kept well up to the light and in the full blaze of the sun, as recommended for *Lælia autumnalis*. By the beginning of July the plant will most probably have finished flowering, and from then until March it possesses no great beauty, but water should not be discontinued until November, after which time it may be given once or twice in three or four weeks until March. Sometimes the growths, when they do not produce flowers, continue growing to four or five feet in length, and when well grown the plant increases in size very rapidly. Red spider is most troublesome to this plant, and directly it can be detected the growths should be sponged with soapy water.

A fair average price for strong flowering-sized bulbs is about 3s. to 5s. each.

ZYGOPETALUM MACKAYI, var. INTERMEDIUM. From Brazil.

This is a winter-blooming species, generally making a good display about Christmas. It is a strong growing plant when in good health, producing spikes about two feet in length bearing six to eight flowers, the sepals and petals of which are of a greenish colour, spotted with brown, the lip being white, exquisitely pencilled with blue lines. The plant should be repotted during March, and the thick fleshy roots delight in a compost of peat and coarse river sand and broken charcoal, and a little fibrous loam may also be added. The pot should be half filled with good drainage with a layer of moss on the top of it, and the plant should receive water in moderation, never allowing it to be continually saturated or to become too dry. The time when it should be kept moderately dry is the short period after flowering until active growth sets in. In potting keep the soil below the level of the rim and press down moderately firm, afterwards standing the plants on the stage of the house.

Good established plants should be purchased for about 10s. per strong leading bulb, and newly imported from 5s. to 7s. 6d.

**TWENTY-FOUR ORCHIDS RECOMMENDED FOR A
WARM, STOVE, OR EAST INDIA HOUSE.**

AERIDES ODORATUM. From the East Indies.

This is an old and familiar Orchid, yet one of the best in cultivation, and, like all of this species, is evergreen and has no pseudobulbs. The flower spikes proceed from the stem at the axils of the leaves, bearing a large number of wax-like flowers in the form of a fox's brush (one of this family, *A. Fieldingi*, being termed the Fox's Brush Orchid), looking very delicate and graceful, and has a very pleasing fragrance. This plant is easily cultivated in a Warm house with a moist temperature, these being essential requirements for its successful cultivation. I prefer pot culture for it, and supporting the growth in an upright position, although I have seen it well grown in baskets, letting the growth take its own course and ramble where it pleased. The drainage hole in the bottom of the pot should be enlarged and the pot filled to within three inches of the rim with broken pots and charcoal, into which the stems of the plants should be placed, securing them in an upright position with sticks. All roots which were previously beneath the surface should be carefully laid out beneath or upon the crocks, covering with sphagnum to the depth of about three inches, pressing it down firmly, and shearing off the rough ends of the moss with a pair of scissors, any aerial roots remaining as before, but all that can conveniently be bent down to the surface of the moss should be pegged

there by means of small pegs or sticks, so that they may enter the moss of their own accord, for if placed beneath the surface after previously being exposed to the air they generally die.

It is not necessary to remove the whole of the old sphagnum every year, but it is well to pick out some of the old and surface with new once a year, and it should be kept well watered during summer, but not so much given at the roots in winter, yet never allowed to get too dry. This Orchid exists chiefly on the atmosphere, and especially during its time of flowering on no account should it suffer from drought, or an unnecessary loss of foliage will occur. It should be grown on a stage on the north side of the house, or in some other rather shaded situation. When the plant loses its bottom leaves some cultivators make a practice of cutting the stem and lowering the plant in the pot so that the plant may be clothed with foliage down to the pot, but this is not a good practice, for if left alone new growths will shoot from the bare stem and will in time hide this bareness. Of course, should the lower part of the stem be in a bad condition, and without roots, and to all appearance dead, then it should be lowered by cutting away all that which has decayed.

The family of *Aërides* is generally very subject to a small brown scale which clings tenaciously to the leaves and must be removed, and afterwards sponged occasionally to keep the scale down.

Good strong plants of this species should be purchased at from 7s. 6d. to 21s. per leading growth, according to its strength and height, established or imported.

ANGRÆCUM SESQUIPEDALE. From Madagascar.

This is one of the most remarkable and beautiful Orchids in cultivation, and is usually called the "Comet Orchid," the flowers of which are large, of a lovely ivory-white, of great substance, as though formed of wax and of star-like shape, and with a tail upwards of twelve inches in length, this appendage more or less being a peculiarity with all the members of this family. It is a plant of easy growth, requiring similar treatment to that recommended for *Aërides odoratum*, which is of somewhat similar habit, and should be grown in pots surfaced with sphagnum, and is very partial to a moist, shady part of the house, but not far away from the glass; a humid atmosphere best suiting it during the growing season. It flowers during the winter months (December and January), and it must be borne in mind that, in cultivating Orchids of this class, every effort should be made to maintain their foliage, for, when no pseudobulbs exist, the foliage is a great source of strength; therefore, it is best to avoid extremes in drought and cold, especially when the plants are bearing their flower spikes.

Good strong plants of this Orchid are expensive, and one that would produce two flower spikes with three or four flowers on each,

would cost from 40s. to 60s. Good healthy young plants, which would produce one spike with two or three flowers, and suitable for growing on, should be purchased for about 21s.

ANGRÆCUM SANDERIANUM. From Madagascar.

This is a much smaller growing species than the foregoing, and the flowers, which are pure white and numerous, are arranged very neatly on either side of a pendulous spike about one foot long, and forming a beautiful natural spray, which can be used with charming effect in a lady's toilette, either for the shoulder or hair. It should be grown in small baskets or pans suspended from the roof in a moist and shady part of the house, and requires exactly the same kind of treatment as recommended for *A. sesquipedale*. The flower spikes commence growing in the autumn, but do not open their blossoms until February or March.

Good strong plants should be from 10s. 6d. to 21s. for one leading growth capable of producing one or two spikes each year.

CALANTHE × VEITCHII. Garden Hybrid.

Calanthes are found in most of the large establishments, even where Orchids generally are not cultivated, and being winter-blooming plants they are popular favourites. A compost of good yellow turfy loam, with a good amount of broken charcoal and coarse silver sand added, is the best for it. The pot should be filled to one-third its depth with good drainage, and the compost, which should be pressed moderately firm, left half-an-inch below the rim in order that the plant can be well watered. The bulbs should be potted singly, in from 4-inch to 6-inch pots, or two or three smaller ones in a 6-inch, and should have the old compost and roots entirely removed before being placed into the new pots. The base must be inserted about half-an-inch deep in the fresh compost, and secured in an upright position with a small piece of stick to which the top of the bulb can be fastened, when new roots will speedily be formed. Repotting should take place every year, for it is highly injurious to these *Calanthes* to be kept in the same soil two years in succession; doing it in February or March, when the new growths are about one inch long and young roots begin to push out and are ready to take firm hold of the new soil.

Although many persons grow *Calanthes* extremely well, there are numerous others who signally fail in doing so, owing to some details in management not being understood, such as care in watering and the position the plant occupies after the bulbs are potted. They should be placed in the warmest house, quite near to the glass—a high shelf being a most suitable place—where there is an abundance of light, and very little water given, not commencing the watering until a week after repotting and about once a week after, until the foliage is well up, say

six inches high, and the plants well rooted, and then they should have water as often as ordinary plants simply when dry.

With strong growth the formation of new bulbs takes place about July and then a little weak liquid manure is beneficial, such as can be obtained by soaking cow or sheep manure and using it in a well diluted form at every watering until the flowers commence expanding and the bulbs become denuded of foliage, then cease giving liquid manure, and only give sufficient water to keep the soil from becoming too dry and to keep the flower in full vigour.

When the plants are out of flower water may be entirely withheld until the potting season in March comes round, the plants in the meantime being kept in a light and dry place, but when in flower they can be removed to a warm conservatory or greenhouse, where the flowers will last a month longer in perfection. They are cheap and of easy propagation, the new pseudo bulbs often throwing two new growths, whilst the old ones also grow and form new small bulbs, if laid upon some sphagnum or something of a similar nature and kept moist. The flower spikes are from two to three feet high, and the flowers of a bright rose colour.

Good bulbs are obtainable for 3s. 6d. to 5s. each.

CALANTHE VESTITA RUBRO-OCULATA, AND *C. VESTITA LUTEO-OCULATA*.
From Java.

Two varieties which are very useful and generally grown, the flowers of both being pure white, but the variety *rubro* has a red eye, and *luteo* a yellow eye; the flower stalks are not so tall or erect as in *Calanthe Veitchii*, but the same treatment does for all, and bulbs should be purchased about the same price.

Many wrongly treated plants of *Calanthes* are subject to a disease known as "spot," which comes on both the foliage and the bulbs, and when once contracted it takes years of excellent treatment to eradicate it; so in purchasing bulbs it is necessary to see that the skin has a clear appearance and is totally free from black marks or spots.

CATTLEYA LAWRENCEANA. From Guiana.

Although this lovely Orchid may be grown with those requiring less warmth, its cultivation is much more satisfactory in a Warm house, and it can either be grown in pots or baskets, but must be well up to the light, and should be in a compost of peat, sphagnum, and broken charcoal, as recommended for *Cattleyas* (see page 32), and the plant should be placed on the south side of the house in a warm and light position.

It is usually late in the season, about October, before the new pseudobulbs of this species are matured, and the plants should then be placed at the coolest part of the house, or they may be removed to a



SELENIPEDIUM (CYPRIPIEDIUM) SEDEN.

house having an Intermediate temperature (but this is not necessary), and brought back to the Warm house after blooming in April. The flowers of this species are of good size, varying in number in proportion to the strength of the plant, and the colour is of a rich purple tint.

Good plants should be obtained at from 7s. 6d. to 10s. 6d. per strong lead, imported or established plants.

CATTLEYA ELDORADO. From Rio Negro.

This is another handsome, delicate coloured species, which does best in a little more warmth than that of the Intermediate house, and it should be grown in pots placed on a shelf or in baskets suspended. It flowers during the summer months and requires a high temperature in the winter, so should not be removed from the Warm house. For general treatment as to potting, watering, &c., see the section *Cattleyas*, page 32.

There is a variety of this species which is pure white and named *C. Eldorado Wallisii*, and another *C. Eldorado crocata*, bluish white with a deep orange blotch in the throat, but the typical form is more or less of a rose tint with an orange blotch in the throat, and the lip is of a deep purple shade.

Good plants of this species should be purchased at from 5s. to 7s. 6d. per strong leading growth, and in this case also it is preferable to purchase newly imported or semi-established plants, taking great care to preserve the native leaves as much as possible.

CYPRIPEDIUM LAWRENCEANUM. From Borneo.

The Warm house is really the home for the great majority of this large genus, although there are some few species, as before stated, which do well in a Cool house. This *Cypripedium* has two recommendations in its highly ornamental foliage and handsome flowers, the greater beauty of the latter centring in the dorsal sepal, which is white, striped with a number of purple lines. It should be potted as advised for *Cypripediums* (see page 35) and given a shady position on the stage, with a liberal supply of water at all seasons, and, as this family of Orchids is partial to a good deal of water, it is best that they should be repotted at least once in every two years, otherwise the compost may become too much decomposed and the drainage defective, and under such circumstances the plants would not flourish. Should thrip attack them a little tobacco powder dusted into the axils of the leaves will soon accomplish its destruction.

This species flowers during the summer months, and good strong plants are obtainable at from 3s. to 5s. per strong flowering lead.

SELENIPEDIUM (CYPRIPEDIUM) SEDEN. Garden Hybrid.

This is a lovely and valuable garden hybrid, which continues flowering for some months from one stem, for when one flower is over

another appears from the same stem, and is of a pale rose shade of colour. Being a very free grower it soon makes a large plant, which produces a good number of flowers during the autumn and winter months, and should have a shady position with the general treatment recommended for *Cypripediums*.

Plants of this variety should be purchased at from 5s. to 7s. 6d. per strong flowering leading growth.

SELENIPEDIUM (CYPRIPEDIUM) ROEZLII. From Colombia.

This is another very interesting species with the same characteristics as *C. Seden*, continuing to produce its flowers from the same stem for a long time, requiring similar treatment, compost, potting, &c., but is of a stronger habit of growth; it commences blooming in April.

Strong established plants, and such are recommended, can be purchased at from 5s. to 7s. 6d. per strong lead.

SELENIPEDIUM (CYPRIPEDIUM) DOMINIANUM. Garden Hybrid.

This is another very interesting garden hybrid, and more pleasing and quaint in its character than the two preceding varieties. It is the result of a cross between *C. caricinum* and *C. caudatum*, and is intermediate between the two, the long petals coming from the last named species, which has long tail-like petals, from 20 to 30 inches in length, and flowers during the spring months. It requires the same treatment, in every particular, as the preceding sorts.

Good plants should be purchased for about 7s. 6d. per strong flowering-sized leading growth, which, under proper management, soon grows into a large plant.

CYPRIPEDIUM BELLATULUM. From Cochin China.

In this species, as well as in its allied species, *C. niveum* and *C. Godfroyæ*, both of which are most chaste and pretty, an entirely different method of cultivation will have to be adopted, as they do not lend themselves quite so readily to the treatment generally given to *Cypripediums*. They are, however, of easy culture, if a more decided mode of cultivation is followed. The potting material should consist of a mixture of rich fibrous loam broken into small lumps, adding small lumps of chalk, varying from the size of a pea to that of a walnut, and these two materials, in equal proportions, should be mixed together. The pot should be well drained to one third of its depth, and the plants fixed rather firmly in the compost, bringing the latter almost level with the rim of the pot. The plant should then be placed in a position near the glass—on a shelf would be a most suitable place—where it can have plenty of light, at the coolest end of the house, taking care that it is not overwatered, for sometimes where every care is exercised, a leaf occasionally damps off at the axils. Special attention must therefore be given to the watering or much serious damage will result from the

damping off of the foliage, but it is a plant which really requires but little water at any time of the year, more especially during the winter months, and when it is applied see that the foliage is kept dry or the water frequently lodges in the axils of the leaf and causes damping. In order to prevent this, dip the pot up to the crown of the plant (not over) in a bucket of water, which is better than the ordinary method of watering.

It is not easy to draw a hard and fast rule as to how often the plants should be watered, and growers must be guided by the size of the pot and the quantity of material it contains, as well as the position the plant occupies, for if light and airy the compost becomes dry more readily than if shaded and close; and although the surface of the soil may appear to be dry the plants may still not require water, owing to the retention of moisture in the chalk and soil. This species flowers during the spring and summer months and is always admired.

Good established plants should be purchased at from 5s. to 7s. 6d. for strong flowering sized plants, and as this species is more readily established than many others of the same genus, newly imported plants may be purchased with good results.

DENDROBIUM NOBILE. From Assam.

The Dendrobiums are a beautiful and useful family of plants, easy of cultivation, some requiring more warmth throughout the year than others, but for the majority of them it is indispensable they should have a high temperature and moist atmosphere during the summer months, whilst throughout the winter a cool and rather dry atmosphere is needed to give the plants the necessary rest in order to produce good flowers and growth next season. *D. nobile* belongs to the latter group. When repotting becomes necessary, use good fibrous peat with an equal proportion of sphagnum and a little charcoal mixed together, and the pots or baskets half filled with crocks and charcoal, always repotting just after the flowering season is over. All the old compost should be cleaned away from the roots, which should be carefully handled, when replacing the plant in the new pot or basket, securing the growths by a few neat sticks thrust into the compost, which should be made moderately firm. A good position in the Warm house on the south side, where there is plenty of light, is most suitable at first, watering carefully, and keeping the compost only moderately moist until the roots show signs of activity, then water more freely, for careless watering at this stage often causes a loss of new growth by damping.

As the summer advances the plants gain strength, if not checked by excessive drought or too low a temperature, or failure to keep them clear from red spider or thrip; and the new growth develops into a pseudobulb, and when it is seen to taper off and the last leaf appears at the apex the new bulb will have ceased growing. This species,

however, is so very free growing that as soon as the new pseudobulb is formed other growths are pushed from the base, sometimes even before the new bulb has finished its growth, but this is of little consequence. Supposing the principal or first growths are completed by September, the plant should at once be removed to a cooler house where it could have plenty of sunshine and air to mature the growth, but when the first growths come to maturity earlier, the plant may still remain in the Warm house to assist the second growths, but not later than September or October. The removal to a cooler house means the coldest end of the Intermediate house, or even a greenhouse, where the temperature does not fall much lower than 45 degrees in winter, gradually withholding water—giving only just sufficient to prevent shrivelling; and when showing flower the plants should be removed in January into a little more warmth. The plants then would bloom about April, but if wanted in flower a little earlier they should be removed to the warmest house, but avoiding a sudden change from cold to heat, increasing the water gradually, for if given too freely immediately after the plants have come from their resting quarters, buds which should become open flowers sometimes turn into growths. When such flower buds turn to growths they may be taken off when rooting with a heel of the old pseudobulb, and propagated, allowing only those to remain that come from the base. The flowers appear from the sides of the bulbs formed in previous years. This is always a cheap Orchid at from 1s. 6d. to 2s. per strong leading bulb, and may also be bought newly imported, as they generally make strong healthy plants. The varieties of *D. nobile* are numerous and vary in size and colour, the most distinct being *D. nobile album*, and the best dark form *D. nobile nobilium*.

DENDROBIUM × AINSWORTHII. Garden Hybrid.

This is a very pretty and useful hybrid, the result of a cross between *D. nobile* and *D. aureum*, and more adapted to basket than pot culture, but with the same treatment as that of *D. nobile*.

This also is a cheap Orchid and obtainable at from 5s. per strong flowering-sized leading growth.

DENDROBIUM AUREUM. From the East Indies.

This species is of a golden yellow colour and deliciously scented, and does best in baskets, but with the treatment given to *D. nobile*, and it also blooms from the preceding year's pseudobulbs.

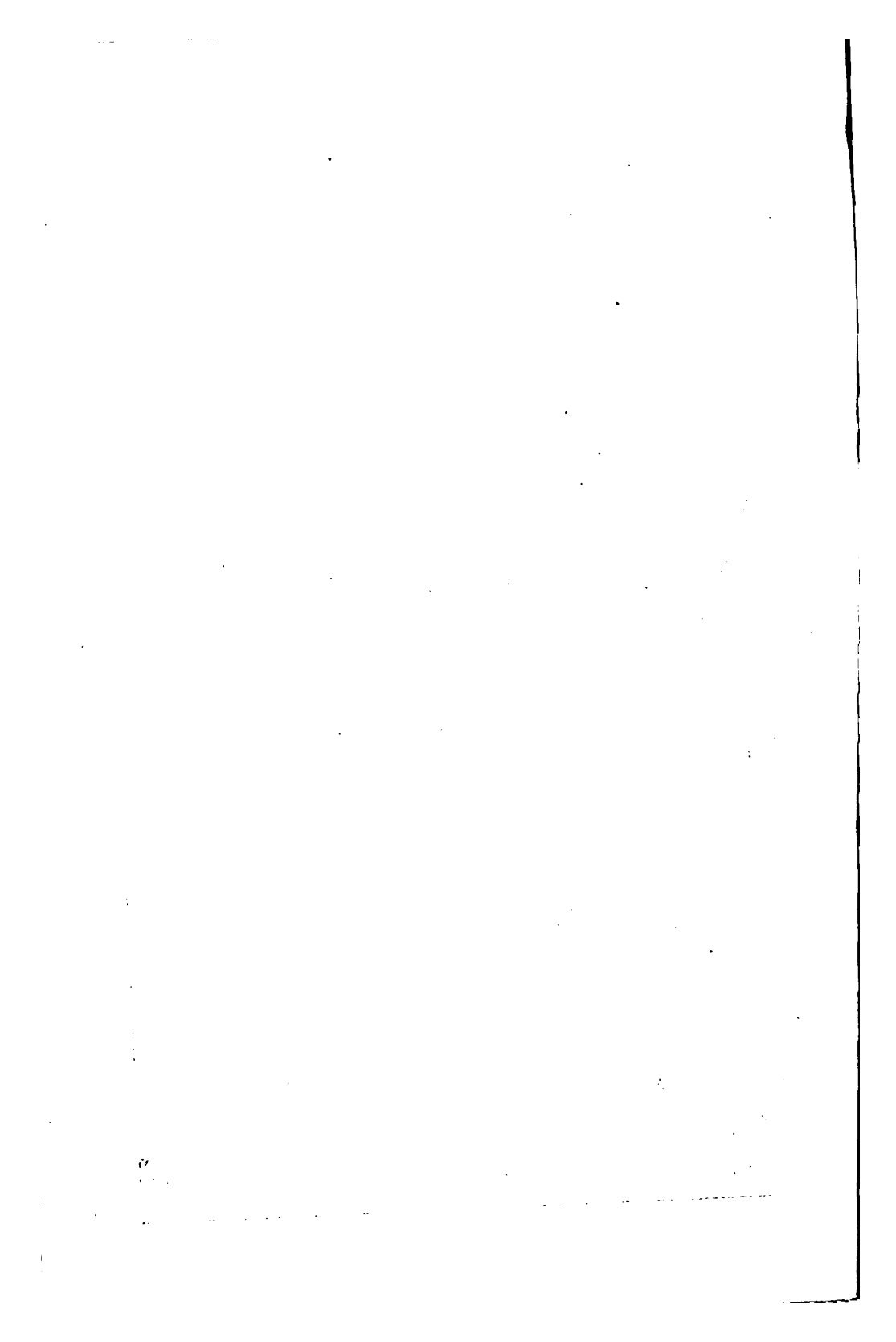
Good established plants should be purchased for about 5s. per strong leading bulb, and newly imported plants at a cheaper rate, as they grow very freely. Let 50 degrees be the minimum during winter.

DENDROBIUM FINDLAYANUM. From Burmah.

Although different in habit to the preceding it is a very pretty species, flowering in the late winter or early spring months, the flowers



DENDROBIUM NOBILE.



being produced on the newly made pseudobulbs; a few flowering nodes, however, remain dormant, which flower the following year, in conjunction with the newly made pseudobulbs; the temperature of the Intermediate house is sufficiently low for this species during the resting season; like the preceding species, 50 degrees is low enough. In all other respects it should be treated as recommended for *D. nobile*. Its sepals and petals are white, tipped with pink, the lip having a large yellow blotch in the centre.

This should be purchased at 2s. or 3s. per strong leading pseudobulb, and may be bought either newly imported or established.

DENDROBIUM FORMOSUM GIGANTEUM.

From Burmah.

This is a very handsome Orchid, and the flowers are borne at the apex of the newly formed pseudobulbs directly they are matured, and in large trusses, according to their strength. This species will not grow satisfactorily unless in plenty of warmth, and it must not be taken into a cool temperature to rest but remain in the warmest house the whole year. It must be grown in pans or baskets, and in transferring plants to either it should be done in spring, just as the new growth begins to push forth; and if in baskets, be suspended in the warmest part of the house in a light position, giving compost and treatment similar to that of *D. nobile*. Watering should also be done in a similar manner, only that, being kept in a much higher temperature during the resting season, it is unable to endure so much drought and should therefore have more water. It flowers during August and September, and the flowers are large and pure white, with the exception of an orange blotch on the lip. Occasionally yellow thrip will attack the young growth, and tobacco powder should immediately be applied for their removal.

Good plants should be purchased from 3s. to 5s. per strong leading pseudobulb, and it is best to obtain newly imported or semi-established plants.

DENDROBIUM PHALÆNOPSIS SCHRÆDERIANUM.

From New Guinea.

This is a very useful and beautiful autumn-flowering Orchid, similar in habit to *D. superbiens* and *D. bigibbum*, and the flowers of this species are produced on spikes issuing from the top of the newly formed pseudobulbs. The flowers vary considerably in colour, some being almost pure white, others a rich dark rosy purple, but the majority are of a rich rosy-tinted shade. The plants require exactly the same culture as that for the last named species. I have always found this plant to do well when suspended from the roof or placed on a shelf in the hottest portion of the house, giving plenty of water

during the summer, and at no time allowing it to get dry enough to cause much shrivelling as this greatly injures the plant.

Thanks to the large importations which have recently arrived this plant can now be bought at a low price—say, about 5s. to 7s. 6d. per strong leading growth.

DENDROBIUM WARDIANUM. From Burmah.

I may assuredly say of this, that it is a magnificent species, and, fortunately, plentiful in this country, as large importations are received every spring. I recommend newly imported plants, and sturdy pieces should be obtainable for about 2s. or 2s. 6d. per strong lead. It may be grown in either pots or baskets and with the same treatment as *D. nobile*, both in the growing and resting seasons. But with this species it is necessary to give definite treatment, for, unlike the last named, it is most detrimental to the plant when it starts into growth a second time in the same year, and any such attempts should be frustrated at the outset. In order to prevent this it should be removed to a cooler temperature immediately the pseudobulbs are completed, gradually lessening the supply of water. It is quite natural, however, for such growth to make its appearance some time during the winter, and at the same time to push its flower buds from the last formed pseudobulbs; but the appearance of either growth or flower bud should not tempt the cultivator to straightway place his plants in greater heat, but to continue a cool treatment so as to ensure slow and sturdy growth, and when placed in more warmth, about February, it will make rapid progress and speedily bloom, and every encouragement should then be given the plant to make healthy growth, by giving it abundance of light, heat, and moisture. The sepals and petals are pure white, handsomely margined with bright pink, and in the centre of the flower are orange and chocolate blotches.

PHALÆNOPSIS SCHILLERIANA. From the Philippines.

This Orchid is one that has baffled many good growers, even those who have everything that is necessary to successful cultivation within their reach, yet from some unexplainable reason they fail to make much headway with this plant. This is somewhat difficult to understand, as others who only give ordinary care and attention obtain excellent results, much seeming to depend upon the house in which it is grown. I, however, advise everyone to give it a trial, for, if the place suits it, the plant is of great interest, even when not in bloom, on account of its handsome foliage.

Its handsome flowers are produced on long branching spikes, from December to February, and are of a soft pale mauve tint, and it should be grown in baskets suspended near the glass on the shady side of the house, too much bright light being injurious, and it should be placed

into the basket in much the same way as recommended for *Aërides odoratum*, simply fixing in the sphagnum over a good drainage of crocks and charcoal, and the foliage will then droop over the sides of the basket. Give a liberal supply of water during the summer, but less, with great discretion, during the winter, never allowing the sphagnum to get quite dry, or the plant, having no pseudobulbs, will lose its foliage, which is prejudicial to future growth. It should be grown at the warmest part of the house and its leaves occasionally sponged to keep down insects, using tobacco powder if thrip appears.

Phalænopsis are at times injuriously affected by a watery spot forming on the leaves, and this should at once be cut away with a sharp knife or it will soon spread and eat away the leaf, and generally speaking, when this disease occurs, the idea of successfully growing the plant may be abandoned. The spot is often produced from some fault in management, such as from a very cold temperature, keeping the plants saturated in winter, or some other cause. The common ant will sometimes kill the Phalænopsis if allowed unimpeded sway.

Good plants, suitable for growing on and established, should be purchased at from 10s. 6d. each.

ONCIDIUM PAPILIO. From Caracas.

This Orchid is known principally on account of its remarkable resemblance to the butterfly, hence its name Butterfly Orchid, and can be grown either on a block or in a small pan or basket, in which it should be securely fixed. It is a compact growing plant and the flower spikes, which are long and slender, are produced from the base of the last pseudobulb and the flower at its apex, one following the other in succession for several years, so that the old spikes should never be cut away unless the plant gets into a weak condition.

Plants may be purchased for about 4s. to 5s. per leading bulb, and newly imported plants may be purchased with highly satisfactory results.

PHAIUS GRANDIFOLIUS. From the East Indies.

This is an excellent old Warm-house terrestrial Orchid and is to be found in most gardens of note. The compost most suitable being fibrous loam and lumpy peat in equal parts, adding a little coarse sand and broken charcoal, and when repotting is necessary it should be done immediately after flowering in February or March, following the directions given for *Cymbidium eburneum* (see page 103), and watering only when dry. It should be grown in pots placed on the stage on the shady side of the house, and as this species is subject to attacks from yellow thrip, tobacco powder should be dusted well into the axils of the new growth in order to dislodge or destroy the insects.

Good plants should be bought at from 5s. to 7s. 6d. per strong leading growth.

STANHOPEA TIGRINA. From Mexico.

This is one of an extremely interesting family of Orchids and of considerable beauty and richness of colour, which counterbalances the short life of the flowers. This species must be grown in baskets having no crocks at the bottom, and only sphagnum and fibrous peat. It flowers during the summer months, and these are produced on spikes which have pushed their way downwards through the soil and basket, so that crocks would greatly intercept and damage the flowers. The ground colour of the flower is either pale or orange yellow, spotted and barred with dark chocolate-red, and the flowers give out a very powerful perfume which pervades the whole house, and from its habit of pushing its flower spikes through the roots must be grown in baskets suspended from the roof at the coolest part of the house, giving water in moderation all the year. The leaves should be sponged occasionally to keep down red spider, and if attacked by thrip use tobacco powder. Insecticides are very dangerous to the young growths, frequently causing them to rot, even when applied in a weak form.

Good plants from 5s. to 7s. 6d. per strong leading growth.

CHYSIS BRACTESCENS. From Mexico.

This is a handsome species, bearing large trusses of wax-like white and yellow flowers during March or April, and, although very beautiful, the flowers are rather short-lived; it may be grown with the *Dendrobiums*, as it requires exactly the same treatment as regards heat and moisture during summer and a cool rest during winter. It should be grown in a basket suspended in a light position, and being subject to yellow thrip, tobacco powder should be used in preference to insecticide, as the young growth is very tender and liable to rot. The flowers push forth simultaneously with the new growth.

Newly imported or established, 3s. 6d. to 5s. per strong lead.

The inexperienced cultivator, in following the instructions laid down in the selection of twenty-four Orchids for Cool house culture and the same number each for the Intermediate and the Warm house, will begin to understand how to ensure good results and obtain a thorough knowledge of their requirements, and knowing the extent of his resources will be able to realise what reasonable chance he has of success with his plants, and have a fair idea also of the probable cost of good plants to start with.

SUPPLEMENTARY VARIETIES.

IT has occurred to me that some who may have the means at command for still further extending their collections may be glad to have reliable information as to other sorts they may desire to grow; therefore, I propose to give a supplementary list of another twenty-four Orchids suitable for Cool house culture, also twenty-four more for the Intermediate house, and the same number for the Warm house.

TWENTY-FOUR ORCHIDS FOR COOL HOUSE.

ODONTOGLOSSUM HALLII. From Ecuador.

This Orchid requires the same treatment as *O. crispum*, the sepals and petals of the flower being of a yellowish tint, blotched with bright brown, the lip white and yellow, flushed with purple. Flowers during the spring months.

Price 5s. to 10s. 6d. per strong lead, purchased as newly imported or as established plants.

ODONTOGLOSSUM LUTEO-PURPUREUM. From Colombia.

This requires the same treatment as *O. Hallii*, and there is also great variation in this species. The flowers of the typical form are of a yellowish ground colour, with large blotches of bright brown, whilst the lip is also yellowish, with brown spots, and it flowers during the winter and spring months.

Good strong leading bulbs should be bought at from 4s. to 7s. 6d. each, and may be had newly imported or established.

ODONTOGLOSSUM EDWARDII. From Ecuador.

This should have the same treatment as recommended for *Oncidium macranthum* (see page 80). The flowers are pretty, of a violet-purple colour, and are freely produced on long erect branching spikes during the spring.

Plants, either established or newly imported, from 5s. to 10s. 6d. each strong lead.

ODONTOGLOSSUM BICTONIENSE. From Guatemala.

This requires the same treatment as the last named, and it flowers during the autumn and winter months; the sepals and petals are

greenish, with brown spots, and the lip of a pinkish colour. There is also a white variety of this species.

Newly imported or established plants from 3s. 6d. to 5s. each.

ODONTOGLOSSUM BLANDUM. From Ocaña.

This requires the same treatment as *O. crispum*. The flowers are delicate and neat, and borne on slender, short spikes, the ground colour white, densely spotted with reddish brown, and emitting a pleasant perfume.

Newly imported or established plants from 5s. to 10s. each.

ODONTOGLOSSUM MACULATUM. From Mexico.

This requires the same treatment as *Oncidium macranthum* (see page 80). It produces its flowers during the winter months, and in colour is a combination of green, chocolate, and purple.

Newly imported or established plants 3s. 6d. to 5s. each.

ODONTOGLOSSUM CORDATUM. From Colombia.

This requires the same treatment as the last named, and it blooms during the winter and spring months, the sepals and petals being of a yellowish tint, covered with broad marks of chestnut-brown, and the lip white, with brown spots.

Newly imported or established plants 3s. 6d. to 5s. each.

ODONTOGLOSSUM PULCHELLUM MAJUS. From Mexico.

Requires the same treatment as the last named species, and blooms during the winter and spring months, sending up neat spikes which carry a number of pretty white flowers.

Newly imported or established plants, having not less than three or four leads, should be bought for 5s. and 7s. 6d. per plant.

ODONTOGLOSSUM NEBULOSUM. From Mexico.

Requires the same treatment as the last named, and the flowers of this species are white, more or less spotted with reddish brown, and are produced during the winter and spring.

Newly imported or established plants 3s. 6d. to 5s. each.

ONCIDIUM MARSHALLIANUM. From Brazil.

Should be grown in pans or baskets and suspended, and the flowers are produced on long branching spikes, which make their appearance from the base of the new bulbs in autumn, and grow all the winter. The chief beauty in this flower is the large and bright yellow lip. This *Oncidium* has also the reputation of deteriorating, which it does if allowed to flower from weakly plants. It is therefore advisable to pinch off the spikes of such every alternate year.

It is best to purchase newly imported or semi-established pieces at from 5s. to 7s. 6d.

ONCIDIUM FORBESII. From Brazil.

This species must be grown exactly the same as the last named, and also deteriorates if allowed to flower each year, so that it is advisable to pinch off the spikes from all weak or undersized bulbs. Its flowering time is in the autumn, and the flowers are of a rich orange-brown, edged with gold. It is an exquisite Orchid when well grown.

Newly imported or semi-established plants 3s. 6d. to 5s. each.

ONCIDIUM ORNITHORHYNCHUM. From Guatemala.

This requires the same treatment as *O. macranthum*, and is a free growing and floriferous species, producing delicate branching spikes with a number of small strongly perfumed flowers of a rosy purple colour; blooming during the winter and spring months.

Newly imported or established plants from 3s. 6d. to 5s. each.

MASDEVALLIA HARRYANA CÆRULESCENS. From Colombia.

This should have the same treatment as recommended for *M. Harryana* (see page 16), as this is only one of its many varieties, but the flowers are of a larger size and the colours more rich and brilliant; it flowers in the spring.

Established plants can be purchased of the true variety at 5s. per two leading growths.

MASDEVALLIA × CHELSONI. Garden Hybrid.

This is a hybrid between *M. Veitchiana* and *M. amabilis*, and is a free grower and bloomer. It should have the same treatment as *M. Harryana*, and this variety also flowers during the winter.

Good plants, with three or four leads, about 5s. each.

MASDEVALLIA SHUTTLEWORTHII. From Colombia.

This is a pretty little species and should be grown in small baskets or pans suspended, and with the same treatment as *M. Harryana*; it flowers during the spring months. The flowers are rose and yellowish green, more or less spotted with dark red.

Established plants, with about three or four leads, 7s. 6d.

PLEIONE LAGENARIA. From Khasia Hills.
(The Indian Crocus.)

In this very beautiful little Orchid we have one differing in so many respects from the majority, for there are no old pseudobulbs, as these become exhausted by the time the new pseudobulbs are matured about September, at which period the latter lose their leaves, and from the base commence pushing up their flowers, which expand in October and November, and immediately they have flowered the plants can be shifted into a fresh compost of fibrous loam, peat, sphagnum, and sand.

The pans should be three parts filled with drainage and the compost left level with the rim, and on this the bulbs should be placed, from 10 to 12 in a 6-inch pan or basket, at equal distances apart. These should be secured in their positions by means of small pegs, and the surface between the bulbs carefully covered with sphagnum, so that about half of the bulb is beneath. Very little water will now be required—simply enough to keep the sphagnum moist until the foliage is well up, when a liberal supply may be given until the growth is completed.

This species is very partial to much light and should therefore be suspended near to the glass, and if possible, without injury to the other plants, let this have direct sunlight upon it, seeing at the same time that the plant does not suffer from drought. Watering must be less frequent when the bulbs are matured and begin to lose their foliage. The sepals and petals are of a mauve-rose tint, and the lip white, yellow, and dark crimson, and the flowers open near to the surface of the pan and are singularly beautiful. Unless a suitable position can be found for this species it will probably fail, and in such a case a light place in a little warmer house should be given it.

Newly imported or established plants 1s. to 1s. 6d. per strong bulb.

PLEIONE MACULATA. From Assam.

This is a lovely companion to the preceding, and should have similar treatment, but cannot withstand quite so much strong sunlight; it also blooms during the autumn, and the sepals and petals are pure white. Remove to a warmer and lighter house if unsuccessful.

Newly imported or established plants, 1s. to 1s. 6d. per strong bulb.

ANGULOA RUCKERI. From Colombia.

This is a noble growing Orchid, and should be treated exactly the same as advised for *A. Clowesii*. The flowers, which appear in summer from the base of the pseudobulbs, are of a yellowish ground colour, tinted with orange-red.

Newly imported or established plants vary from 7s. 6d. to 10s. 6d. and 15s. per strong leading bulb.

MAXILLARIA VENUSTA. From South America.

A very pretty sweet-scented Orchid with white and yellow flowers, much in the way of *M. grandiflora* and require the same treatment. It flowers in the autumn months. Give it the warmest part of this house or in the Intermediate house during winter.

Newly imported or established plants 3s. 6d. to 5s. per strong leading bulb.

LÆLIA HARPOPHYLLA. From Brazil.

This is a very pretty Orchid, and the uncommon colour of the flower makes it a very conspicuous object when in bloom. It flowers

in February and March, and is of a bright orange-vermilion colour; should occupy the warmest part of the house, especially during winter.

Newly imported or established plants at 3s. 6d. to 5s. for two strong leading bulbs.

DENDROBIUM FALCONERI. From Northern India.

This is a very beautiful Dendrobe and amply repays any trouble expended on it, and does best grown on a block of wood, a portion of a tree fern stem, or on a teak-wood raft, and may also be grown in pans or baskets. Its natural habit is to send out new growths in great profusion anywhere on the old bulbs, and in time forming a thick mass of short knotty pseudobulbs, which are connected with the stem or portion of the tree from whence it first started by means of a few slender stems only. This fact should be clearly noted by the cultivator when fixing his plants, and it will be seen that there is little use in trying to keep the plant too much confined to the block, but plenty of water should be given to the aerial growths during the summer and up to September, by the free use of the syringe, but after this date the supply of water must be gradually reduced to about once a week or longer. Under this treatment the plant may be expected to flower satisfactorily, but without this long and perfect rest, from November until the nodes are seen to be sending forth tiny shoots, it will not. When these tiny shoots appear from either side of the bulb, about March, more water may be given, but only sparingly, otherwise they will turn to growths instead of flowers. After the shape of the flower bud can be detected, it is quite safe to apply water without stint. This species flowers in May, the colours of the flowers being dark crimson, white, and yellow. The plant should be suspended.

Buy newly imported clumps in spring at from 3s. 6d. to 7s. 6d.

CÆLOGYNE CRISTATA LEMONIANA. From Nepaul.

This lovely species must be treated in the same way as advised for *C. cristata* (page 89), it being a variety differing only by the colour on the lip being pale lemon instead of orange, and it blooms in February or March.

Established plants, with from four to five leads, at from 7s. 6d. to 10s. 6d.

LÆLIA DAYANA. From Brazil.

This should be treated in the same manner as advised for *Lælia præstans* (page 90), the chief difference in the flowers being in the lip, and it blooms in the autumn.

Newly imported plants are best, but good established plants can also be purchased, with two or three leads, at from 5s. to 7s. 6d. each.

CYPRIPEDIUM BOXALLII. From Moulmein.

This very pretty species is grown in exactly the same way as advised for *C. villosum* (page 89), and the flowers have a glazed appearance like that species, but in this plant the dorsal sepal is heavily spotted with dark purple, and it flowers during the winter and spring months.

Established plants, 3s. 6d. to 5s. per strong flowering growth.

TWENTY-FOUR ADDITIONAL ORCHIDS FOR THE
INTERMEDIATE HOUSE.

ÆRIDES FIELDINGI. From the East Indies.

(The Fox's Brush Orchid.)

This species should be potted and watered as recommended for *A. odoratum* (page 113), but it should be grown on the shady side of this house, and it flowers in spring.

Good plants should be obtained with six or eight leaves, suitable for growing on, at about 7s. 6d. to 10s. 6d., established.

CYMBIDIUM LOWIANUM. From Burmah.

This is a handsome free growing species, producing long spikes of flowers during the summer, the colour is of a greenish yellow with a blotch of deep red on the lip, and should have the same treatment as *C. eburneum* (see page 103).

Newly imported or established plants from 5s. to 10s. 6d. per strong lead.

EPIDENDRUM WALLISII. From New Granada.

This is a free growing species with pretty yellow and spotted flowers, and when the plant has grown to a good size it remains a long period in bloom; it should be grown in peat, sphagnum and charcoal, and it can be treated as recommended for *Sobralia macrantha*.

Established, from 10s. to 15s. per strong leading growth, though at present it is not very common, and a little difficulty may be experienced in obtaining small plants.

LÆLIA CINNABARINA. From Brazil.

This species blooms in the spring months; the flowers are of a rich, deep, reddish orange colour, and the flower spikes appear from the top of the bulbs, and, as with all *Cattleyas* and *Lælias*, in some cases the sheaths from which the spikes come appear to be dead, but this makes no difference to the plant blooming. This species will not

bear so much sun as *L. anceps*, and requires the same treatment as *Cattleya Trianae* and others.

Newly imported or established, from 3s. 6d. to 5s. per strong leading bulb.

LÆLIA ANCEPS SANDERIANA. From Mexico.

This is a beautiful white variety of *L. anceps*, and like that species should be grown in a basket, and fully exposed to sunlight; it flowers during the winter months. The true "alba," which is without any dark markings in the throat, is very rare.

Newly imported or established, about 10s. 6d. per strong leading growth.

LÆLIA ALBIDA. From Mexico.

This pretty little species, which flowers during November and December, has flowers which are mostly white, and will not bear quite so much sunshine as *L. anceps*, but in other respects should have the same treatment.

Nice clumps, newly imported in spring, with four or five leads, for about 5s.

LÆLIA × ELEGANS. From Santa Catherina.

This is supposed to be a natural hybrid between *Lælia purpurata* and *Cattleya Leopoldii*, and it may be grown in pots or baskets, but should be placed in the warmest position during the winter.

Nice plants, newly imported or established, should be obtained for about 7s. 6d. to 10s. 6d. per leading bulb.

CATTLEYA SKINNERI. From Costa Rica.

This handsome and useful species blooms in April or May, and is of easy culture, requiring exactly the same treatment as that advised for *Cattleyas* generally.

Newly imported or established plants, at 3s. 6d. to 5s. per strong leading bulb.

CATTLEYA BOWRINGIANA. From Honduras.

This should have the same treatment as the last named, being somewhat similar, and I have sometimes thought that this species produces a greater number of flowers when grown in baskets and suspended.

Newly imported or established, at 3s. 6d. to 5s. per strong leading bulb.

CATTLEYA AMETHYSTOGLOSSA. From Brazil.

A tall growing species, and therefore must be in pots, requiring the same treatment as *Cattleyas* in general. The flowers are of a rosy purple colour, more or less spotted with deep magenta,

Good strong leads, newly imported or established, at from 5s. to 10s. 6d.

CATTLEYA INTERMEDIA. From Brazil.

This is a very pretty summer-flowering species, much like *C. Harrisoniana* in habit of growth, and should be treated like that species, with the exception of the winter time when it is in active growth, during which time it should, if possible, be at the warmest end of the house, or taken to a Warm house.

Newly imported or established, 5s. to 7s. 6d. per leading growth.

CATTLEYA HARRISONIANA. From Brazil.

A very useful and pretty species, in appearance very much like *C. Loddigesii*, but the colour of the flower is much darker and with an orange blotch in the lip instead of lemon—the same treatment is required for both.

Newly imported or established for about 5s. per strong growth.

CATTLEYA MAXIMA. From Ecuador.

This is a charming autumn-flowering species and must be treated like *Cattleyas* generally, but does best in baskets suspended in a shady part of the house. The sepals and petals are of a bright deep rose colour, and the lip is prettily lined or veined with dark red.

Newly imported plants in spring, or semi-established plants, for about 5s. per strong leading bulb.

CATTLEYA PERCIVALIANA. From Venezuela.

This is the earliest of all the *C. labiata* section, coming into flower in January and February; the colours of the flowers vary and are very much like *C. Mossiae*, the chief characteristic difference being in the smaller size and the exceptionally rich colour of the lip. This species should be grown in company with *C. Warscewiczii*, where it can get plenty of sun, otherwise it fails to bloom freely. During autumn and winter it should be placed at the warmest end of the house, otherwise the flowers may not come to perfection.

Newly imported or established, about 5s. per strong leading bulb.

MASDEVALLIA TOVARENSIS. From Venezuela.

This is a small growing, lovely, pure white species, and produces an abundance of flowers in November or December; must be grown in the Intermediate house, for if kept too cold during the winter the plant loses its leaves and dies. The culture, otherwise, is the same as recommended for *M. Harryana*, but the old flower stems should not be cut off, as these produce flowers again the following season.

Good established plants, with from four or five leads, should be purchased at from 4s. to 5s. per plant,

PILUMNA FRAGRANS. From New Granada.

This species sends up its spikes from the base of the pseudobulbs during autumn or winter, and its flowers are very pretty, mostly pure white with a little blotch of yellow in the throat, and are deliciously fragrant and useful for bouquet work, and its general treatment should be the same as *Cattleyas*.

Newly imported or established pieces, for about 5s. per strong lead.

TRICHOPILIA SUAVIS. From Costa Rica.

This is a lovely species and flowers in March or April, producing flower spikes from the base of the last made pseudobulbs, and the flowers are nearly white with a number of pretty pink spots on the labellum. This species is best grown in a basket suspended in a light part of the house.

Newly imported or established, for about 5s. per strong lead.

VANDA CÆRULEA. From Khasia Hills.

This is undoubtedly the best of all the *Vandas*, and produces its beautiful sky-blue flowers during the early autumn, which last a long time in perfection, but should be cut two or three weeks after they open or the plant will probably become exhausted and fail to give good results the following year. It can be grown in a pot or basket, and up near the roof glass so as to have an abundance of light and air. After passing through a period of dull weather, bright sunlight is very injurious to *Vandas*, and this should be avoided, especially in spring, or a loss of leaves will result. For instructions as to potting, watering, &c., see *Aërides odoratum*, page 113.

Unless the culture of this species is very carefully attended to it is apt to get spotted on the foliage, and these spots appear on the tips of the leaves and should at once be cut away to save the leaves.

Newly imported or established plants, with one lead, 7s. to 10s. 6d. each.

VANDA SUAVIS. From Java.

This is another beautiful *Vanda*, and more robust in constitution than *V. cærulea*. It should be grown in a pot occupying a position on the stage with the *Cattleyas*, and in potting, watering, &c., have the same general treatment as *Aërides odoratum*. It blooms during the spring months, a strong stem sometimes pushing out three or four spikes, and this species grows to a great height.

Established plants, suitable for growing on, should be purchased for 7s. 6d. to 10s.

CYPRIPEDIUM ARGUS. From the East Indies.

This pretty little species may be grown in a damp and shady part of the house, and treated the same as advised for *C. Lawrenceanum*, and it produces its flowers in March or April, the petals being heavily spotted.

Established plants, 3s. 6d. and 5s. per leading growth.

LYCASTE DEPPEI. From Mexico.

This species must be treated in the same way as *L. Skinneri*, but as it does not bloom until spring a good rest should be given to it through the winter in a light and airy position, which will induce the plant to flower with greater freedom. The sepals are greenish yellow, the petals white, and the lip yellow.

Newly imported plants if possible, or established, 3s. 6d. to 5s. per strong leading growth.

LYCASTE AROMATICA. From Mexico.

This species, if well grown and with a good rest as recommended for *L. Deppei*, will produce a large quantity of golden yellow flowers from the last formed bulbs in spring, the flowers appearing simultaneously with the new growths, and when the latter is seen to be starting into growth and repotting is necessary, it should then be done, otherwise if the plant is left until it has finished blooming, the new growths will be too far advanced and the plant receive a great check.

Newly imported if possible, or established, at from 3s. 6d. to 5s. per strong leading bulbs.

SOBRALIA XANTHOLEUCA. From Guatemala.

This is a handsome yellow flowered variety which blooms in May or June, and must be treated as advised for *S. macrantha*; but is by no means so plentiful as that species, and is, therefore, more expensive.

Small plants, suitable for growing on, however, should be bought for from 21s. upwards, established if possible, or newly imported.

ODONTOGLOSSUM INSLEAYI. From Mexico.

This is a pretty winter-flowering species, and in growth bears a great resemblance to *O. grande*, in company with which no better place can be found to grow it than the Intermediate house, treating it just the same as the last named variety, except that a little more water must be given in winter until it has flowered. The sepals and petals are pale brown, densely spotted with rich reddish brown, and the lip is yellowish in colour and slightly spotted.

Newly imported plants if possible, or established, at from 5s. to 7s. 6d. per strong leading growth.

THE FOLLOWING ARE TWENTY-FOUR ADDITIONAL
KINDS FOR THE WARM HOUSE.

SACCOLABIUM BLUMEL. From the East Indies.

This very pretty Orchid, which flowers in July or August, must be grown in exactly the same way as recommended for *Aërides* and *Angræcums*; the flowers, which are produced on long pendulous racemes, are white flushed with rose and splashed with dark rose.

Good plants, newly imported or established, 5s. to 10s. 6d.

CATTELEYA ACLANDIÆ. From Brazil.

This pretty interesting little *Cattleya* does best grown in a basket suspended on the lightest side of the house. It is a quick grower, and usually makes two or more growths during the summer, flowering from each. The sepals and petals are heavily marked with dark blotches, and the lip is of a pretty rosy purple colour.

Newly imported or semi-established plants, 5s. to 7s. 6d. per two strong growths.

CYPRIPEDIUM CHAMBERLAINIANUM.

This is a new and very pretty species, and, owing to its very recent introduction, has not, in my opinion, yet been seen in perfection. It bears a number of flowers in succession on one spike, the predominating colour being a pleasing shade of purple, and should have the same treatment as warm *Cypripediums* in general.

Established plants, 5s. to 7s. 6d. per strong leading growth.

CYPRIPEDIUM CURTISII. From Sumatra.

This species has prettily marked leaves, and the dorsal sepal is white and green with slight purple veins, the petals being very similar in colour but with darker spots, and the pouch is of a purplish colour, and it should have the same treatment as the last named.

Established plants, about 5s. per strong lead.

CYPRIPEDIUM VENUSTUM. From Sylhet.

The foliage of this species is decidedly ornamental and the flowers are also very pretty, the dorsal sepal of a greenish colour, tinted with yellow and veined with purple, and the sepals are similarly coloured, whilst the lip is of a purplish tint veined with green. It should have the same treatment as *C. Lawrenceanum*.

Established plants, 3s. 6d. to 5s. per strong flowering-sized lead.

CYPRIPEDIUM HOOKERÆ. From Borneo.

This species also has strongly marked foliage, and its flowers are exceedingly interesting; the prevailing colours are green and purple, the petals being spotted, and it should have the same treatment as *Cattleya Aclandiae*.

Established plants, 3s. 6d. to 5s. per strong leading growth.

CYPRIPEDIUM NIVEUM. From the East Indies.

This is a chaste and lovely little species, with pure white flowers, with the exception of a few very small dust-like purple spots. It flowers in the summer, and must be grown in the same way as *C. bellatulum*.

Newly imported or established plants can be bought for about 5s. per small clump.

CATASETUM BUNGEROTHII. From Venezuela.

This is a beautiful Orchid, the flowers of which are large and of a wax-like, ivory white colour, requiring the same treatment as recommended for *Chysis bractescens*. The flower spikes push up from the base of the new pseudobulb immediately its growth is completed, which is generally about July, and after flowering it should have a rest, as with *Dendrobiums*, letting 50 degrees be the lowest winter temperature.

Newly imported or established, 7s. 6d. to 10s. 6d. per leading bulb.

MILTONIA ROEZLII. From Colombia.

(*Syn.* *Odontoglossum Roezlii*.)

Truly a lovely Orchid, the flowers of which are produced at nearly all seasons of the year and are pure white, sometimes with a yellow or red eye in the centre. It is, however, rather difficult to cultivate unless in the position adapted to it, then it will grow freely, and the coolest and dampest end of the house, where the foliage gets damp nightly, suits it admirably.

Established, 3s. 6d. to 5s. per strong leading growth.

DENDROBIUM CRASSINODE. From the Arracan Hills.

A beautiful species, requiring exactly the same treatment as recommended for *D. Wardianum* (*see page 126*), with this exception that it will not stand so much cold during winter. The flowers rival that lovely variety in point of beauty, but are smaller.

Newly imported or semi-established, 2s. 6d. to 5s. per strong lead.

DENDROBIUM DENSIFLORUM. From the Khasia Hills.

This is another lovely golden-yellow flowered species, growing and flowering in the same manner as *D. thyrsiflorum* (*see page 105*), and should be placed with that plant during the winter months when in a dormant state, and always treated in a similar way.

Newly imported or established, 2s. 6d. or 5s. per leading growth.

DENDROBIUM CHRYSANTHUM. From Upper Burmah.

This species flowers in the autumn from the pseudobulbs just formed, and whilst many of the leaves are still quite green, it should therefore not be dried before flowering. During the winter growth re-commences, and the plant placed in an intermediate temperature and moderately watered, when it will grow gently on until spring and can then be placed in the Warm house. It should be grown in a basket, suspended, and the long bulbs allowed to droop downwards, often attaining a great length. The flowers are of a deep golden yellow, marked in the centre with almost blackish chocolate. Pot when the growth is two or three inches long, and pushing new roots.

Newly imported or established, 2s. 6d. to 5s. per strong lead.

DENDROBIUM PIERARDI. From the East Indies.

This very pretty species should be grown in pans or baskets, as the growth has always a downward tendency, but in all other respects it should have the same treatment as advised for *D. Wardianum*, which suits it admirably. The flowers are of a creamy white colour and produced in spring. Newly imported plants are best, or established, from 1s. 6d. to 3s. 6d. per strong lead.

DENDROBIUM LUTEOLUM. From Moulmein.

The flowers of this species are of a lovely primrose-yellow, and it should be grown in baskets suspended in a light position, and when its growth is completed may be rested in an intermediate temperature, but being an evergreen species it should not be dried off too much. The flower buds soon push forth and expand if the plant is left in this house; remove into more warmth after it has ceased flowering. Do not allow the flowers to stay on too long.

This species is in the habit of making a great number of aerial growths, and these, as with *D. Falconeri*, should be allowed to remain, bringing them down to the compost only when re-basketting.

Newly imported or established, 2s. 6d. to 5s. for good plants.

ONCIDIUM KRAMERIANUM. From Colombia.

This is another species of Butterfly Orchid, at first sight very closely resembling *O. Papilio*, but on examination there is much difference between the two; both, however, require the same treatment.

Newly imported or established, 3s. 6d. to 5s. per strong lead.

ONCIDIUM CAVENDISHIANUM. From Guatemala.

A very pretty species, and the flowers are produced during the winter months on spikes from the base of the last formed growth, and are yellow with brown spots. The pseudobulbs are very minute in comparison with its large fleshy leathery leaves, and it should be grown in pots on the light side of the house.

Newly imported or established, 3s. 6d. to 5s. per strong lead.

PERISTERIA ELATA. From Panama.

(*The Dove Orchid*; also the *Holy Ghost plant* of the natives.)

It produces its flower spikes in the summer months from the base of the pseudobulbs, some of which I have seen as large as a cocoanut. The spike bears a number of flowers which are white, and in the centre of each a portion of the flower bears a close resemblance to a small dove, and it is altogether a most interesting plant. It should be potted and treated in the same manner as advised for *Phaius grandifolius*.

Newly imported or established, 5s. to 7s. 6d. per lead.

STANHOPEA OCLATA. From Mexico.

This is another showy species, and should be cultivated exactly as advised for *S. tigrina* (*see page 128*). The ground colour of this species is light yellow, thickly marked with bright chocolate spots, and it flowers in the autumn.

Newly imported or established plants are from 5s. to 7s. 6d. per strong leading bulb.

STANHOPEA INSIGNIS. From Brazil.

This species is also very showy and blooms during the summer months, and must be treated in the same way as the foregoing.

Newly imported or established plants are worth from 5s. to 7s. 6d. per strong lead.

MORMODES PARDINUM. From Mexico.

This is a handsome and curious Orchid, which flowers in the same manner as *Catasetum Bungeorothii* and must have the same treatment in every respect. The ground colour of the flower is yellow, densely spotted with chocolate.

Newly imported or established plants 5s. to 10s. 6d. per strong lead.

CATTLEYA LUEDEDEMANNIANA. From Venezuela.

(*Syn. speciosissima.*)

A lovely species of the labiata section, the flowers very much resembling those of *C. Mossiae*, and it flowers during the autumn months. This species, like *C. Aclandiae*, is rather difficult to grow and flower successfully unless given a warm temperature, and it should be grown in a pan or basket suspended in a very light position.

Newly imported or established, 5s. to 7s. 6d. per strong leading bulb.

ONCIDIUM FLEXUOSUM. From Brazil.

This is a small-flowered species, but generally admired on account of its freedom of growth and its light and graceful many-flowered spikes, the colour of the flowers being yellow and brown. It has a somewhat rambling habit of growth, and does best when grown in a pot in the usual compost of sphagnum and peat, and placed in the shady side of

the house, the plant always thriving well in a moist atmosphere, as the roots feed on the air. When it is found necessary to repot it, the leading growth should be kept well down into the compost, so that a fresh start in growth is made from the latter. This species requires a good supply of water at the root and should not be allowed to get too dry even in the winter, and it flowers during the summer months.

Good plants should be purchased for about 5s. per strong leading growth.

CYPRIPEDIUM BARBATUM. From Mount Ophir.

This is another species with pretty marked foliage, and produces its flowers during the summer months, the dorsal sepal being white, green, and of a dark purplish colour, and the pouch tawny brown, while in some of its varieties the colour is much darker than in others. The pouch of the true *C. barbatum nigrum* is almost black.

Established plants 3s. 6d. to 5s. per two leading growths.

CYPRIPEDIUM STONEI. From Borneo.

This very pretty species should be in every collection. The dorsal sepal is china white, pencilled with red and purple, and shaded with ochreous yellow; petals long and narrow, same colour as the sepals; and the lip or pouch dull purple, with reddish veins. There is a variety, *C. Stonei platytaenium*, which is very handsome, unique in its beauty, and is also expensive, and is likely to remain so, as *C. Stonei* does not increase so rapidly as most of the other *Cypripediums*. It should have the same treatment as *C. Lawrenceanum*.

Established plants, 7s. 6d. per strong leading growth.

There are of course many other beautiful kinds which could be enumerated, indeed, the supply of species together with their separate varieties is almost inexhaustible, but I feel that quite sufficient have been named to answer the purpose for which this book is compiled, *i.e.*, that of placing the new beginner upon a solid foundation from which to work.

In addition to the many gardening periodicals which treat more or less on Orchids, there are also many books which have been published from time to time, some of which could be taken up with advantage, after this little book has been thoroughly digested, but until the rudiments of Orchid culture are understood, such books may perplex rather than assist. Acting on this principle I have omitted long botanical descriptions of stem, foliage, date of introduction, or their early history, neither have I endeavoured to correctly describe the colours and shape of the flowers, only sufficiently to enable the beginner to form an idea as to whether he possesses the correct species or not, and I have enlarged somewhat fully, but in simple terms, on the cultural treatment required by the various genera of Orchids.

ORCHIDS WHICH MAY BE GROWN IN VINERIES OR PEACH HOUSES.

In an early chapter it was stated that I could not advise the culture of Orchids in fruit growing houses, and I intended these words to apply to Orchids generally, but when a vinery or peach house has been started in February or March, then the warmth such a house would afford would exactly suit the requirements of a few species of Orchids. By the time the fruit had ripened, and it became necessary to give the vines or fruit trees plenty of air in order to thoroughly ripen the wood, the new growth of the Orchids would be in an advanced condition and able to withstand, and indeed, would be benefited by large quantities of air and cool treatment, provided it be not too cold, remaining here until it became necessary to start the houses in the following year.

The following list indicates such Orchids as would be likely to succeed, and generally do well under such treatment, although I by no means assert that they are *sure* to do so, and it would be necessary to start with good plants and pay strict attention to cleanliness:—

| | |
|---|----------------------------------|
| DENDROBIUMS (excepting those requiring more warmth during winter) | CYMBIDIUM Eburneum |
| LELIA ALBIDA | " Lowianum |
| " ANCEPS (IN VARIETY) | CYRTOPODIUMS, ALL THE SPECIES |
| " AUTUMNALIS | CYPRIPEDIUM × AMANDUM |
| " MAJALIS | " ARGUS |
| SOBRALIAS, ALL THE SPECIES | " × ARTHURIANUM |
| THUNIAS, ALL THE SPECIES | " × ASHBURTONIÆ |
| VANDA SUAVIS | " BARBATUM |
| " TRICOLOR | " BOXALLII |
| " CÆRULEA | " × CROSSIANUM |
| " INSIGNIS | " × HARRISONIANUM |
| " KIMBALLIANA | " HIRSUTISSIMUM |
| BARKERIAS, ALL THE SPECIES | " INSIGNE, AND ITS VARIETIES |
| CATASETUMS, ALL THE SPECIES | " × LATHAMIANUM |
| CATTLEYA MOSSIAE | " × LEEANUM |
| " GASKELLIANA | " × NITENS |
| " WARSCWICZII (<i>syn.</i> GIGAS) | " × GENANTHUM |
| " HARRISONIANA | " PURPURATUM |
| " TRIANÆ | " × SALLIERI |
| " LABIATA | " SPICERIANUM |
| CÆLOGYNE CRISTATA, AND ITS VARS. | " VENUSTUM |
| " MASSANGIANA | " VILLOSUM |
| " SANDERIANA | SELENIPEDIUM (CYPR.) × CARDINALÆ |
| " CORRUGATA | " " SCHLIMII |
| " OCELLATA | " " × SEDEN |

ORCHIDS IN SMOKY TOWNS.

Although many kinds can be grown in town gardens there are some, the delicate flowers of which open in the winter and are not suitable for cultivation where a smoky, foggy atmosphere prevails, such for instance, as the genus *Phalænopsis*, and this is much to be regretted as the plants are often so much at home in town gardens, and are frequently met with in a flourishing state under such circumstances, but as they generally bloom in the winter the flowers are much too delicate to withstand dense fogs and the flowers therefore rarely open, the buds turning yellow and dropping off.

The spring-flowering *Dendrobiums* also give trouble in this respect, such species as *D. nobile* and the numerous hybrids produced from it, notably *D. × Ainsworthii*, *D. × Leechianum*, and such species as *D. Wardianum*, *D. crassinode*, and a few others, for heavy fogs are almost certain to destroy the flower buds of these varieties which flower early in the season if placed in too much warmth.

It is, therefore, better to retard their blooming by keeping them cool and not allow the flowers to expand until April, then the flowering state may be expected to be more satisfactory as the fogs then are fewer and less dense.

Some of the *Cattleyas* also give trouble, especially *C. Percivaliana*, and *C. Trianae*, both being early-blooming species, and invariably lose their flower buds under the influence of dense fogs.

There are several other kinds which also suffer, but not so severely as those already mentioned, such as *Lælia anceps* and other winter-flowering *Lælias*, the *Calanthes*, *Cattleya labiata*, and all of these suffer in a more or less degree, sometimes managing to unfold their sepals and petals but perhaps only for a short time.

Cypripediums and *Odontoglossums* are to be recommended as probably the best kinds of Orchids for the greenhouses of large towns, for although a large number of these flower in the winter, the flowers are better able to resist, without injury, the action of thick smoky fogs, but which would be fatal to the bloom of others. They are also most interesting and easily grown, many of the former having handsomely marked foliage, the flowers varying so much in form and colours, and a moderate-sized collection of them ensures an interesting display of flowers throughout the year.

RESULTS OF FURTHER EXPERIENCE OR THE AMATEUR'S ORCHID HOUSE.

HAVING since the publication of the Second Edition of this work resigned my position at Highbury, in order to start business as an Orchid Specialist, and at the same time undertaken to pay personal visits to demonstrate and tender advice on matters appertaining to the successful cultivation of Orchids, I am, in a sense, better qualified to pen these lines than was previously the case; for during the time I have been so engaged I have visited many collections, both large and small, and do not hesitate to say that in all cases I have learnt something—which knowledge I will impart to others. I have invariably—no matter in how poor a condition the collection generally may be in—seen one or more species in a particularly thriving state; the why and the wherefore I am always pretty careful to fathom. This fact having induced me to further experiment at home with my own plants I can conscientiously commit the following to paper, and will endeavour to do so, even more down to the level of the amateur, who I will assume knows little or nothing about orchid growing. It being the result of further experience, as above stated, the methods of cultivation hereafter recommended may appear at first sight to slightly contradict in some few instances advice previously tendered in this work. But after careful consideration I prefer to leave the last named entirely as first written, it being the embodiment of carefully thought out considerations in all details that are necessary to first bring success, whilst this will doubtless appear to readers to be a somewhat rash treatment to adopt, but it is one I can at the same time strongly recommend to their notice, asking that the one may be allowed to tone the other wherever any doubt may exist.

Now to commence with my subject, I am assuming that the would be cultivator has only one house which can conveniently be devoted to orchids the whole year round, and he wishes to have a number of easily grown kinds that will succeed with a general collection of plants. Here I beg to give amateurs and new beginners a word of advice, and to point out a mistake often made when they are commencing. They desire to grow Orchids, and think, and are perhaps sometimes told, that Cool Orchids may be grown in their greenhouse with a varied collection of half-hardy plants with no extra cost for increased warmth. But I must explain that the term *Cool Orchids* is an elastic one. There are so many so-called Cool Orchids, but the question is, can they be grown successfully in an ordinary greenhouse with an ordinary collection of half-hardy plants? The answer is, No! They may not die, they may even grow, but rarely do they increase in size, or make plants

satisfactorily. Their failure is not so much due to an insufficiency of heat, as to the aridity of the atmosphere—too much air at times, or too much sun. It should be borne in mind that Orchids, though fond of fresh pure air are also fond of moisture and shade to a reasonable extent. They also require a somewhat regular and evenly balanced temperature, and this is seldom found in an ordinary greenhouse. Better companions for Cool Orchids, if we consider the year throughout, are ferns and the warmer kinds of greenhouse plants, of which there are large numbers, not necessarily stove plants but sometimes classified as such.

The kinds that I would strongly recommend to amateurs are those commonly known as Intermediate, for such is the temperature that best suits the great majority. Most of those classified as *cool* and *hot* kinds grow equally as well intermediate, whilst but very few indeed require *strong heat*, or are *very cool* growing. There is therefore absolutely no reason whatever why the amateur with his one house should not grow an enormous number of species from various parts of the world with a great deal of success, and especially so if the structure has a small portion partitioned off, or if he possess a cool frame so as to provide better summer accommodation for *Odontoglossums* of the *crispum* section and just a few other cooler sorts.

Now to proceed with the subject of cultivation, and in order to make the same as clear as possible let us put the whole of those commonly called intermediate, as well as those already known as cool growing kinds, into one category and class the whole as *Cool Orchids*. sub-dividing them again into two classes or sections, which we will call the “warmer” and the “cooler” sections of cool growing Orchids. The first named will differ from the last mentioned only because they naturally prefer more warmth during the summer months when they are making their growth—in other words, the growing season in their native habitats is much warmer than their winter or resting season; whilst with the latter section there appears to be but little climatic difference between winter and summer, or the resting and growing seasons. This extra warmth preferred by the “warmer section” while making growth is very easy of attainment. Nature supplies it for us in the form of the sun. We can maintain during the summer any degree of warmth which we may wish. It is indeed easy by not paying due attention to little matters of ventilation and shading to have too much heat. To illustrate my meaning I will here state what I find to be the best treatment and most favourable conditions, which should prevail in the cultivation of those species which we constitute the *warmer* section of the *cool* Orchids; it will then be seen how very simple are their requirements. Generally during the summer there is but little difficulty in keeping the night temperature about 60° or 65°, which is ample. During the days it will range from these figures up

to 70° or 80°, perhaps more. No matter how careful one may be the temperature in hot weather may exceed 80° and frequently go to 90°. It cannot be helped and, although on paper it looks tremendous, it does no harm, for the simple reason that it is perfectly natural for the plants, viz. : Heat by day and cool refreshing nights. It does no harm providing that the ventilation and the moisture is present in sufficient quantities to prevent a stifling oppressive temperature. No doubt they get great sun heat on their native mountains, but it is of course accompanied with abundance of fresh air as well. To day the sun may be powerfully hot, to morrow it may be overcast and comparatively chilly, but this should not compel us to light the fire and heat the pipes so that the interior is as hot in the absence of the sun as with it. It is totally unnecessary, as well as harmful, to keep up a high temperature by fire alone. Supposing then we have a few dull days, as frequently we do, with no sunshine to raise the temperatures, we need not worry and force it up by making a large fire, but simply give less ventilation and employ less moisture and jog along quietly until the sun shines once more. It is perfectly natural for the temperature to vary day by day in their native habitat, therefore it may also do so in our houses. Of course during the spring time, and again during the autumn, we may get a particularly cold night or day, and perhaps a spell of a week or two, then, in order to prevent the temperature from becoming too cold, it is quite another thing, and enough heat in the pipes should be had to maintain the thermometer at about 60°, or a little more or less, and thus produce a healthy circulation of air—preventing it from becoming too cold and stagnant.

From the beginning of March until some time in October it is necessary to have some kind of shading for the purpose of protecting the plants from the sun. Few orchids can withstand the powerful rays of the sun falling direct upon them. If the house is a low built one, necessitating the stages to be pretty close to the roof glass, a permanent summer shading of whitewash may be used with a good deal of success, especially if an additional shading be at hand for use when the sun is particularly bright and persistent for a few hours during the days of the summer months. Should the house be high built, as some of the old fashioned structures sometimes are, the stages consequently being a good distance from the roof, then I should not recommend whitewash or anything permanently affixed, but a roller blind that can be rolled up during the afternoon when the influence of the sun's direct rays is no longer felt, and again let down in the morning when its influence becomes harmful. Some think that the shading should be removed if the clouds obscure the sun for a short time, and be again let down when it reappears, but this is a great tie for the amateur who cannot always be present; it is also unnecessary, for orchids grow none the better for such fussy attention. During choppy treacherous weather it is better to let

the blinds remain down, and ventilate or not, just in accordance to the warmth of the weather.

A little care and thought is necessary when ventilating. It is safer for the amateur to use the bottom ventilators only to admit fresh air, employing the top ones only in warm weather when the atmosphere seems overheated and oppressive. By a too liberal application of top air the atmosphere, which should be kept pretty evenly charged with moisture, is apt to get very dry, hence a little care is required. Orchids when growing are extremely fond of moisture, not so much at the roots as atmospherically. They derive their food and nourishment from the air and the moisture it contains rather than from the saturation of the compost in which they are growing. They are often injured by keeping them too soddened at the root. It is not natural for them to have their roots confined to a mass of continually wet compost. It is much safer to under rather than to over water orchids at their roots, even at the height of their growing season. Especially is it so with plants in large pots. The compost must, however, be kept moist when growing by watering it occasionally.

As a method answering the double purpose of watering the roots almost sufficiently, as well as being all that is needful for damping down purposes, I will here recommend a system of judicious syringing overhead, and this is what this class of orchid delights in above anything else. I have a little lean-to house with a due south aspect where I continue this practice of syringing in lieu of damping and watering throughout the winter months with great success, doing it, not every day, but as often as seems necessary. But for general safety I must not here advise winter overhead damping or syringing, because in some kinds of structures its advantages might be outweighed by its disadvantages. We will start say about the middle of March. Once a day should be sufficient, doing it about nine or ten o'clock in the morning. If the outside conditions should be dull and cold it should then be left undone. This can go on to the month of May when it may with safety be done every morning between 7 and 8 o'clock, and a second time about 3 to 4 o'clock in the afternoon, when the air is reduced and the shading removed; do not however syringe the second time if the outside conditions are not genial. When we get well into June the second syringing can pretty safely be afforded every day, doing it as soon as the shading can be removed with safety, at the same time reducing the air so as to store up a good amount of sun heat to last the night. The bottom ventilators should not be closed unless the weather is very cold and ungenial. On the arrival of the latter end of September the morning syringing only is again sufficient, and by the end of October perhaps it had best cease altogether, falling back then to the daily damping of the stages, paths, &c., and watering those that are dry and need water with the watering can. Let the water used for syringing purposes be at

all times *rain* or *soft pond water*, with a sufficient amount of *clean hot water* added to make the whole lukewarm to the feel. The syringing should be tempered to a large extent by the prevailing weather. It may merely be a spray just enough to moisten the foliage and the surface of the compost, or it may be such that will make everything present the appearance of the outside garden after a drenching summer rain. Do not be afraid of anything. The water may lodge in the new growths, and on the most fragile blossoms, the former will not rot, nor will the latter damp or spot, providing the hot water pipes are warmed more or less when the nights or days, the nights especially, are unseasonably cold.

That pernicious species of Scale which attacks weakly specimens of *Cattleyas* or *Lælias* cannot breed and make much headway under this system of syringing, and by cleaning the plants with a small brush occasionally this scale quickly disappears. I particularly recommend amateurs who are away from home the greater part of the day to give this system of growing a trial, as I am convinced they will find it answer admirably, serving the two-fold purposes of sufficiently watering the plants without saturating the compost, and of producing a beautiful genial temperature suitable for the free, healthy, vigorous growth of the plants, with one tenth part of the claims upon their time, and they will soon discover that to be successful with the culture of orchids does not involve great expense nor time. As the summer advances and its end approaches, the new pseudobulbs will either be matured, or nearing that condition. As the autumn passes and the winter sets in the warmth of the summer sun will no longer be available, nor indeed will it be required. Overhead syringing should be discontinued. The plants will quite naturally finish up their pseudobulbs, and will then lapse into a state of rest, or partial inactivity. During the winter months they will want nothing more than to be kept free from excitement in any form whatever. Water should be given sparingly at the roots. The atmosphere should also be kept somewhat drier. In fact these plants will now demand nothing more than to occupy the same house, or to receive exactly the same conditions and treatment, as the others which I have previously called the "Cooler" sections of cool growing orchids. They all delight in similar treatment during winter and early spring. A temperature varying between 50° and 60° is the best. It may fall as low as 45° or at times even lower. It may likewise rise a little above 60°. But for the greater part of the time, the thermometer should range from 50° to 60°. A nice bright morning should be selected for giving a little water to prevent the roots and atmosphere from becoming too dry, which tends to exhaust the plants. It is surprising, however, what a small quantity is necessary for the purpose during the winter, unless excessive fire heat is used. During hard frosty weather more moisture distributed is needed than in damp

mild weather. Under these simple and easily obtainable conditions, which I have briefly attempted to describe, it is really remarkable what an enormous quantity of different species can be collected in one small house and there together grow, doing well and flowering freely. They are too numerous for me to here find space to mention them each separately. The quickest way for me will be to mention a few names of genera and species which would probably not succeed on account of insufficient heat. The whole of the others left unmentioned may be given a trial with reasonable chances of success. They may not *all grow well*, some are sure to do better than others, it is always so, even when that which supposed to be the most approved treatment is given by professional men. But what I say is, try a few inexpensive kinds to commence with.

Those kinds which I would advise an amateur to avoid for a time, unless it is with just one or two of each to experiment with, are as follows:—The species of *Bollea*, *Pescatorea*, *Phalænopsis*, *Angræcum*, and *Saculabium*. Some few species of *Dendrobium* may also be mentioned, principally those coming from the East Indian Islands, such as *Dendrobium Phalænopsis*, and its var. *Schroederianum*, *D. superbum* (*macrophyllum*), *D. Lowi*, *D. Johnsoniæ* (*Macfarlanei*), *D. superbiens*, *D. bigibbum*, *D. atroviolaceum* and *D. Dalhousieanum*; likewise a few *Cypripediums*, the principal of which are those coming from the hot lowlands of the East Indian Islands, such as *C. Rothschildianum*, *C. Lowii*, *C. Stonei*, *C. philippinensis* and *C. Sanderianum*. *Cattleya Eldorado*, *C. superba* and *C. Aclandiæ* may also fail to do well on account of insufficient warmth. These are all I think that I need point out as being unlikely to grow with much certainty. Of course there a good many *Oncidium*s, *Odontoglossums*, *Masdevallias*, and some few others, independent from those mentioned in the following chapter, that delight in a pretty cold summer treatment. But still, if the house is not partitioned off, or the cool frame is not at hand, the whole, with the exception of those hereafter named, may be tried under the aforementioned conditions, where they will be found to grow very well if suitable positions are selected according to their requirements. The selections of which is the most interesting study of the whole thing, and one which can only be taught by practice, and the looking up of various works and writings on the subject, if necessary, after this work is exhausted.

Remember steam arising from the cold water coming in contact with the hot water pipes is most harmful to any orchid, and produces many ills. Of course it makes no difference on a small scale, such as a little accidentally. But why I mention this fact is because I find it is the custom of some amateurs to syringe the pipes whenever they are hot, to produce a vapour. Truly a moisture is thereby created, but it is certainly the wrong kind of moisture.

THE CULTURE OF ODONTOGLOSSUM CRISPUM AND ALLIED KINDS.

ODONTOGLOSSUM crispum is probably the most popular orchid in cultivation. No doubt it is a most lovely and serviceable species, yet I could never quite understand how an admirer and grower of orchids could cultivate this one species almost to the exclusion of all others, still such is the case in a few instances. Of course *O. crispum* is pretty, but it is absurd to say that it is prettier than hundreds of other species of orchids. It is also interesting, especially when one gets the mania for collecting the real cream of varieties, and the more or less spotted forms. But to the lover of the beautiful, I cannot possibly see how they can be more interesting than the majority of other orchids, or even so much so. Still the fact remains, *O. crispum* at the present day is a popular orchid, and I propose therefore to treat it rather fully in this edition, yet as briefly as possible.

Its cultivation is extremely easy when properly taken into hand, but otherwise it is apt to give a good deal of trouble. I advise all who would grow it to perfection to avoid too much of the kind of treatment that I will term "coddling," which will soon produce rootless drawn specimens that are unable to bear the strain of a strong spike of bloom.

Some Orchids will adapt themselves very well to artificial treatment, even though it may not be quite correct, and still do well, but this is not so with the present species, and this fact renders it a rather risky one for a new beginner to take in hand largely, before he has first mastered the most vital points in its cultivation. It is, however, often one of the first included in a newly formed collection, on the grounds that it is a cool growing species. I will now describe what I have found to be the most successful treatment, which on the whole will, I think, be found pretty correct, and I can conscientiously recommend its adoption by those who wish to succeed thoroughly well.

THE HOUSE.—I greatly prefer a low-built span-roof house, running north to south, either wide enough to admit of a centre step-like stage in addition to the side stages, or the latter only. Such a span-roofed house is not however absolutely necessary, for they may be grown in any other shaped house, and it may be in almost any position, from an aspect of due south to north, the management of course *varying accordingly*. Whatever the structure selected, the means of ventilation, both at top and bottom, must be ample, and the stages must be so arranged so as not to be too far away from the roof-glass. The furthest

point should not be more than four feet, and the nearest not less than one foot from the glass. I greatly prefer, and strongly advise, stages of an open nature, that is to say, a simple greenhouse stage formed of slats of wood, with a space of one or two inches left between each slat so that the air can circulate freely up between the plants. This question of open stages I consider of great importance, if really good results are to be obtained. The air plays a most vital part with these essentially air-loving plants, and the freest circulation which the outside conditions permit is at all times of the utmost importance. It has sometimes been thought that the principal point necessarily lay in the keeping of the house and the plants in a particular wet and humid condition, because of the rains and the exceptionally heavy dews of its native habitat. This explains the origin of closed stages—covered with some moisture retaining material and kept constantly saturated—on which the plants were stood. The idea however has proved to be wrong and misleading. I do not advise anyone who may be growing fairly good plants under such conditions to too suddenly change their methods of culture, or for that matter to change at all, still I am convinced that the idea of closed stages is wrong in principle for any orchid house. It is right of course, especially in summer to introduce large supplies of moisture which they in nature so much enjoy, but we must allow the air to play its counteracting part in our houses, just as it does in their native trees at home, and it is quite unable to accomplish this when the plants are placed on air-proof stages in pots. The air must freely circulate around and beneath them as well as above, in order to grow hardy, healthy plants.

SUMMER TREATMENT.—The treatment during the summer months is extremely simple and consists principally in shading well from the sun's rays, admitting large volumes of air, both night and day, whenever the outside conditions are at all seasonable, and keeping plenty of moisture distributed about the house and plants. But, fond of moisture as *O. crispum* undoubtedly is, the compost in which it is growing should not be kept continually in a state of saturation. I have proved beyond doubt that it does not pay to keep them so. When one comes to think, there seems something most unnatural about it. *O. crispum* is not found growing in bogs and marshes, but high up in the branches of trees, exposed to the full breezes, where it is morally certain they must sometimes get dry as well as wet, roots and all. That they like moisture and cannot get on for long without is well known, but I prefer to see my crispums get pretty dry at the roots before I again water them; the watering they receive in the meantime is overhead syringing with tepid water once or twice daily, according to requirements. This syringing is sufficiently heavy to thoroughly wet the foliage, and to moisten the surface of the compost, but not heavy enough to saturate the whole mass. The temperature of course should be kept as low as the weather will admit.

WINTER TREATMENT.—The treatment is also very simple in winter. A temperature ranging from 50° to 60° should generally be had if possible. It may fall even to 40° in very cold weather, but for short periods only. The atmosphere should then of course be pretty dry, and it would naturally be so unless a great deal of water was thrown down, because the extra heat of the pipes would tend to dry the atmosphere. It may rise above 60° on warm sunny days.

VENTILATION should be freely given both night and day when the outside weather is mild and damp, as it so often is, but less when it is colder, and then by means of the bottom ventilators only. There will also be periods when it is so cold that it is best to keep all ventilators tightly closed. Much less moisture distributed about the house is required than in summer. When it is mild and moist outside, and but little if any fire heat is wanted, as is often the case, whole days may pass by without it being necessary to damp or water at all, the outside air, if allowed to enter, being sufficiently charged with moisture. At this period one should be particularly careful not to over water at the root. Make a point of keeping the whole of the plants, no matter in what stage of growth they are, whether the new pseudobulb is wholly, or only partly matured, on the dry side. Do not however keep them dust dry so as to cause shrivelling—the pseudobulbs should always maintain their plumpness. Those amongst them that are forming their growth should have only little more water afforded than those that are completed. They will then move steadily but surely along. If the house is well exposed to light and air, it is a good plan to lightly syringe overhead in winter also, doing it in lieu of can watering, choosing the morning of a bright day, so that the foliage may to some extent again dry up before night. If the house has a northern aspect where the winter sun is unable to reach it I would advise greater caution in this respect.

SHADING.—*O. crispum*, to be well grown, must be hardily grown, and with this end in view we must subject them to treatment most likely to bring it about. Of course we must shade from the sun during the summer, but do not shade more than is really necessary. If they are staged near the roof glass a thin coating of "whitewash" or "summer cloud" may be painted on and allowed to remain the whole summer, but in addition to this removable blinds should be had for use when the sun is shining. If they are staged a long distance from the glass, then the last named removable shading should alone be used.

By growing them too densely shaded we get long drawn-up, spindly foliage, unable to support its own weight. The foliage should rather be short and standing erect without the aid of any support whatever. Its colour should be a healthy deep green, with here and there a reddish or bronzy tint. This state of affairs can only be brought about by exposing your plants to good light short of actual

sunshine and to as much air as possible, compatible with their well known partiality for moisture. If plants have been tenderly grown they may at first appear to resent such treatment, and may possibly drop a few leaves, but, rely upon it, the result will prove the best in the end.

Those that grow *O. crispum* indifferently will probably have noticed from time to time that the foliage has a decided tendency to become more or less marked, or spotted with watery and eventually black spots. Also that the apex of the leaves decay, which have to be trimmed occasionally to present a respectable appearance, this happening principally during the winter months. This is a sure sign of previous wrong treatment, which has caused a weakened constitution, and it will also be evidence that the existing conditions are too wet, or too cold, probably both, for the latter produces the former. It is frequently brought about in damp weather during winter when, instead of having slight warmth in the pipes with ventilation on, the house is shut up in order to maintain the thermometer to the desired figure without troubling to light a fire, which is a very bad system to follow.

Keep a sharp look out for that insidious little yellow thrip, which cripples the flower buds and marks the foliage so terribly if allowed to breed. To the unpractised eye it is sometimes unnoticeable until the mischief is actually done. On the least signs of it fumigate with XL All Fumigating Insecticide, the most efficacious thing ever brought out.

Another most important item, never repot except when necessary. A plant should safely go for two years and perhaps more. Repot only at the proper time, which is when the new growth has started and is from half an inch to an inch in length. Select them when in that condition, no matter what is the season, whether winter or summer. The following kinds require similar treatment: *Odontoglossum Pescatorei*, *O. × Andersonianum*, *O. × Ruckerianum*, *O. Cervantesii*, *O. gloriosum*, *O. Hallii*, *O. Lindleyanum*, *O. luteopurpureum*, *O. polyanthum*, *O. sceptrum*, *O. tripudians*, *O. triumphans* and *O. Rossi majus*; with others, of course, but, as I have before stated, most others are not so particular and will grow very well in a mixed amateur's house as explained in the preceding chapter.



TABULATED INSTRUCTIONS FOR

Many of the more popular and well-known Orchids are included in the This cannot possibly be avoided without materially increasing the size and price of Should, however, any reader desire further information respecting any of the is a working gardener) will be pleased to supply full particulars on receipt of a

ON WATERING.—All Orchids during the summer months, when making growth, porous, and whenever the compost becomes dry give the plant a good soaking.

| NAMES OF PLANTS | Page | Whether to grow in Cool, Intermediate, or Warm House | Whether preferring a shady, sunny, or partial sunny position | Whether best grown in baskets or pans and suspended, or in pots on the stage | The most suitable compost | | |
|-------------------------------|------|--|--|--|---------------------------|------------------------------|---------------------|
| ACINETA BARKERI | 91 | Inter- mediate | partial | baskets | peat and sphagnum moss | | |
| — DENSE | | | | | | | |
| — HUMSOLDTII | | | | | | | |
| ACROPERA LODDIGESII | 91 | ditto | ditto | baskets or pans | ditto | | |
| * — ARMENIACA | | | | | | | |
| ADA AURANTIACA | 91 | Warm end of Cool house | shady | pots | ditto | | |
| AÆRIDES CRASSIFOLIUM | 113 | Warm | ditto | { pots or baskets | sphagnum moss | | |
| — CRISPUM | | Inter- mediate | | pots | | | |
| — LINDLEYANUM | | | | | | | |
| — WARBURI | | | | | | | |
| — FALCATUM | | Warm | | { pots or baskets | | | |
| — HOULLETTIANUM | | | | | | | |
| — LEONIS | | | | | | | |
| — LAWRENCEÆ | | | | | | | |
| — ODORATUM | | | | | | | |
| — QUINQUEVULNERA | | | | | | | |
| — SAVAGEANUM | | | | | | | |
| — SUAVISSIMUM | | | | | | | |
| — VIRENS | | | | | | | |
| — MACULOSUM | | | | | | | |
| — AFFINE | | | | | | | |
| — LOBBII | | | | | | | |
| AGANISIA CYANEA | | ditto | | sunny | | { baskets pots or baskets | { peat and sphagnum |
| — IONOPTERA | | | | | | | |
| ANGRÆCUM EBURNEUM | 114 | ditto | shady | { pots basket or pans | sphagnum | | |
| — SESQUIPEDALE | | | | | | | |
| — ARTICULATUM | | | | | | | |
| — CITRATUM | 115 | ditto | shady | { basket or pans | sphagnum | | |
| — FASTUOSUM | | | | | | | |
| — LEONIS | | | | | | | |
| — SCOTTIANUM | | | | | | | |
| — SANDERIANUM | | | | | | | |
| ANGULO A CLOWESII | 90 | Cool | ditto | pots | peat and sphagnum | | |
| — RUCKERTI | 132 | | | | | | |
| — UNIFLORA | | | | | | | |
| ANSELLIA AFRICANA | .. | Warm | partial | { baskets or pots | ditto | | |
| ARPOPHYLLUM GIGANTEUM | .. | Inter- mediate | sunny | pots | ditto | | |
| BARKERIA ELEGANS | .. | ditto | very sunny | baskets or blocks | sphagnum | | |
| — LINDLEYANUM | | | | | | | |
| — SKINNERI | | | | | | | |

* These Orchids, with a few others, are apt to get a little irregular in making growth.

THE TREATMENT OF ORCHIDS.

following Calendar, but, unfortunately, there are also many that are omitted. the book, which, in the interest of the numerous small growers, is not desirable. species mentioned, or those not included, the author (who, it must be remembered, remittance of 1s. for each name. delight in a good supply of water, that is, supposing the compost is, as it should be,

| The best time to repot or top-dress | The usual time of blooming | From whence flower spikes appear, and whether on old or new growth | Whether showing spike directly growth is finished or otherwise | The proper resting period, if any | Amount of water at the roots when resting | Whether to winter or rest in Cool, Intermediate or Warm House |
|-------------------------------------|----------------------------|--|--|-----------------------------------|---|---|
| after flowering | spring | base of new pseudobulb through bottom or side of basket | spikes push soon after bulb is completed and grow slowly | the winter months | water sparingly | Warm |
| when new growth commences | summer or autumn | base of new pseudobulb | after rest | when growth is finished | ditto | Intermediate |
| spring | early spring | ditto | when growth is nearly matured | never inactive | water sparingly during winter | ditto |
| February | summer | stem; axil of the 3rd or 4th leaf from the top | ditto | winter | water moderately only | Warm |
| spring | | | | | | warmest end of Intermediate |
| February | | | | | | Warm |
| when new growth commences | summer or autumn | base of new pseudobulb | as soon as growth is finished | ditto | ditto | ditto |
| February | winter | stem: axil of the 3rd or 4th leaf from the top | ditto | ditto | keep moist to support flower spikes | ditto |
| spring | spring | stem; axil of the 2nd or 3rd leaf from the top | | | | ditto |
| ditto when growth commences | early summer | from base of new growth | flower spikes come simultaneously with new growth when pseudobulb is completed | ditto | very little | Intermediate |
| ditto | early winter | apex of new pseudobulb | after rest | late winter | ditto | Warm |
| ditto | spring | ditto | | winter | ditto | Intermediate |
| early spring | autumn | ditto | just before growth is finished | ditto | very little indeed | ditto |

| NAMES OF PLANTS | Page | Whether to grow in Cool, Intermediate, or Warm House | Whether preferring a shady, sunny, or partial sunny position | Whether best grown in baskets or pans and suspended, or in pots on the stage | The most suitable compost |
|--|------|--|--|--|---------------------------|
| BIFRENARIA HARRISONIÆ | .. | Intermediate | partial | baskets or blocks | peat and sphagnum |
| BLETIA HYACINTHINA | .. | Cool | sunny | baskets or pots | ditto |
| — VERECUNDA | .. | Warm | | | |
| BOLLEAS | .. | ditto | shady | ditto | sphagnum |
| BRASSIA CAUDATA | .. | Warm | partial | ditto | peat and sphagnum |
| — MACULATA | .. | Intermediate | | | |
| BROUGHTONIA SANGUINEA | .. | Warm | ditto | blocks | ditto |
| BURLINGTONIA CANDIDA | .. | Intermediate | ditto | baskets or pans | ditto |
| — DECORA PICTA | .. | | | | |
| — VENUSTA | .. | | | | |
| CALANTHE MASUCA | .. | ditto | shady | | peat and loam |
| — VERATRIFOLIA | .. | | | pots | |
| — VESTITA RUBRO-OCULATA | 116 | | | | |
| — LUTEA-OCULATA | 116 | Warm | partial | | peat, loam and sphagnum |
| — VEITCHII | 115 | | | | |
| SANDHURSTIANA | .. | | | | |
| CATASETUM BUNGEROTHII | 140 | ditto | ditto | baskets or pans | peat and sphagnum |
| — MACROCARPUM | .. | | | | |
| — SPLENDENS | .. | | | | |
| CATTLEYA AGLANDIÆ | 139 | ditto | | ditto | |
| — ELONGATA | .. | | ditto | | |
| — AKKETHYSTOGLOSSA | 135 | Intermediate | | pots | |
| — BOWRINGIANA | 135 | | | | |
| — CITRINA | 100 | | sunny | blocks | |
| — DOWIANA | .. | Warm | | baskets or pans | |
| — ELDERADO | 119 | | | baskets or pots | |
| — GASKELLIANA | 92 | | | | |
| — GRANULOSA | .. | | | | |
| — GUTTATA | .. | Intermediate | | | |
| — HARRISONIANA | 136 | | partial | pots | |
| — INTERMEDIA | 136 | | | | |
| — LABIATA | 96 | | | baskets or pots | ditto |
| — LAWRENCEANA | 116 | Warm Intermediate | | | |
| — LODDIGESII | 100 | Intermediate | | pots | |
| — LUEDDEMANNIANA (SPECIOSISSIMA) | 142 | Warm | sunny | baskets or pans | |
| — MARGINATA | 90 | | | | |
| — MAXIMA | 136 | | partial | | |
| — MENDELIJ | 96 | | | | |
| — MOSSIÆ | 96 | Intermediate | | baskets or pots | |
| — PERCIVALIANA | 136 | | | | |
| — SKINNERI | 135 | | sunny | | |
| — SUPERBA | .. | Warm | | baskets or pans | |
| — REX | .. | Warm Intermediate | partial | baskets or pots | |

| The best time to repot or top-dress | The usual time of blooming | From whence flower spikes appear, and whether on old or new growth | Whether showing spike directly growth is finished or otherwise | The proper resting period, if any | Amount of water at the roots when resting | Whether to winter or rest in Cool, Intermediate or Warm House |
|-------------------------------------|----------------------------|--|--|-----------------------------------|---|---|
| summer | summer | base of old pseudobulb | after rest | winter | very little | Intermediate |
| spring | spring | base of new pseudobulb | directly pseudobulb is completed | ditto | ditto | Cool |
| after flowering | summer | base of last made growth | when growth is completed | never inactive | water carefully in winter | Warm |
| ditto | early summer | side of new pseudobulb | after rest | winter | very little | Intermediate |
| ditto | ditto | apex of new pseudobulb | ditto | ditto | ditto | Warm |
| ditto | summer | base of new pseudobulb | before rest | never inactive | ditto | Intermediate |
| ditto | early summer | centre of new growth | when growth is finishing | ditto | keep on the dry side during winter | ditto |
| spring | autumn | base of new pseudobulb | ditto | winter | very little indeed | Warm |
| ditto | summer and autumn | ditto | when pseudobulb is finished | ditto | very little | ditto |
| ditto | twice in summer | | directly | ditto | ditto | ditto |
| after flowering | spring | | after rest | | | Intermediate |
| spring | spring | | | never inactive | very little in winter | Warm |
| summer | autumn | | | | | |
| spring | summer | | | | | |
| spring | summer and autumn | | | | | |
| spring or after flowering | autumn | | directly | winter | very little | Intermediate |
| | autumn or summer | | | | | |
| summer | spring | | | never inactive | water sparingly in winter | Warm |
| spring | autumn | top of new growth | | | | Intermediate |
| | spring | | after rest | | | Warm |
| spring or after flowering | summer | | | winter | very little | Intermediate |
| spring | autumn | | directly | | | Warm |
| after flowering | autumn and summer | | after rest | never inactive | | Intermediate |
| spring | winter | | after short rest | after flowering | water sparingly in winter | Warm |
| after flowering | summer | | after rest | | | Intermediate |
| spring | autumn or summer | | directly | winter | | Warm |
| spring or after flowering | summer | | | | | |

| NAMES OF PLANTS | Page | Whether to grow in Cool, Intermediate, or Warm House | Whether preferring a shady, sunny, or partial sunny position | Whether best grown in baskets or pans and suspended, or in pots on the stage | The most suitable compost |
|---|------|--|--|--|---------------------------|
| CATTLEYA SCHROEDERÆ | 99 | Intermediate | partial | baskets or pots | peat and sphagnum |
| — TRIANÆ | 99 | | | | |
| — VELUTINA | .. | | | | |
| — WALKERIANA | .. | | | | |
| — WARNERI | .. | sunny | baskets or pots | baskets or pots | ditto |
| — WARSCWICZII (GIGAS) | 95 | | | | |
| CHYSIS AUREA | .. | ditto | partial | baskets | ditto |
| — BRATESCENS | 128 | | | | |
| — LIMNINGHEI | .. | | | | |
| CIRRHOPETALUM THOUARSII | .. | Cool | shady | baskets or pans | ditto |
| COCHLIODA (MESOSPINDIUM) NOETZLIANA | .. | | | | |
| — SANGUINEA | .. | Intermediate | sunny | baskets or pots | ditto |
| — VULCANICA GIGANTEA | .. | | | | |
| CELOGYNE CRISTATA | 89 | Warm | sunny | baskets or pots | ditto |
| — DAYANA | .. | | | | |
| — FUSCESCENS | .. | Intermediate | sunny | baskets or pots | ditto |
| — MASSANGIANA | 103 | | | | |
| — SANDERIANA | .. | Warm | partial | baskets or pans | ditto |
| — SPECIOSA | .. | | | | |
| COMPARETTIA FALCATA | .. | Intermediate | partial | baskets or pans | ditto |
| — MACROFLECTRON | .. | | | | |
| CORYANTHES MACRANTHA | .. | Warm | ditto | ditto | ditto |
| CYCNOCHES CHELORCHILON | .. | ditto | ditto | ditto | ditto |
| CYMBIDIUM EBRUNEUM | 108 | ditto | ditto | pots | peat, sphagnum and loam |
| — GIGANTEUM | .. | | | | |
| — LOWIANUM | 134 | | | | |
| — MASTERSII | .. | | | | |
| — PENDULUM | .. | Intermediate | Cool | baskets or pans | ditto |
| — X WINNIANUM | .. | | | | |
| †CYPRIPEDIUM ARGUS | 138 | Intermediate | Warm | baskets or pans | ditto |
| — BARBATUM | 143 | | | | |
| — BELLATULUM | 120 | Intermediate | Warm | baskets or pans | ditto |
| — BOXALLII | 134 | | | | |
| — CALLOSUM | .. | Intermediate | shady | ditto | ditto |
| — CURTISII | 139 | | | | |
| — CHAMBERLAINIANUM | 139 | Intermediate | shady | ditto | ditto |
| — DAYANUM | .. | | | | |
| — DEURYS | .. | Warm | shady | ditto | ditto |
| — FAIRIEANUM | .. | | | | |
| — HAYNALDIANUM | .. | Intermediate | shady | ditto | ditto |
| — HIBSUTISSIMUM | .. | | | | |
| — HOOKERÆ | 140 | Warm | shady | ditto | ditto |
| — INSIGNE | 86 | | | | |
| — JAVANICUM | .. | Intermediate | shady | ditto | ditto |
| — LAWRENCEANUM | 119 | | | | |
| — LOWII | .. | Warm | shady | ditto | ditto |
| — NIVEUM | 140 | | | | |
| — PHILIPPINENSE | .. | Intermediate | shady | ditto | ditto |
| — PURPURATUM | .. | | | | |

† The Hybrids are mostly omitted here owing to their great number, the cultural requirements of the book:—C. X Dominianum, page 120; C. X Harrisianum, page 103; and C. X Sedeni, page 119. Although most other Orchids, a warm Intermediate house would suit nearly all of them admirably.

| The best time to repot or top-dress | The usual time of blooming | From whence flower spikes appear, and whether on old or new growth | Whether showing spike directly or otherwise | The proper resting period, if any | Amount of water at the roots when resting | Whether to winter or rest in Cool, Intermediate or Warm House |
|-------------------------------------|----------------------------|--|---|-----------------------------------|---|---|
| after flowering | spring | top of new growth | after rest | winter | water sparingly in winter | Intermediate |
| spring or after flowering | summer | base of new pseudobulb apex | directly | | | |
| after flowering | summer and autumn | top of new growth from the new growth when starting | after rest | | very little | ditto |
| spring | spring | base of previous year's pseudobulb | directly | | | |
| after flowering | summer or autumn | side of new pseudobulb | after short rest | ditto | ditto | Warm |
| ditto | spring | side of new pseudobulb | after short rest | ditto | water sparingly | Cool |
| ditto | ditto | centre of new growth when starting | after rest | ditto | very little indeed | ditto |
| ditto | summer | centre of new growth when starting | after rest | ditto | very little indeed | Warm |
| ditto | ditto | from new growth | when growth is partly finished | never inactive | water sparingly in winter | Intermediate |
| when growth commences in spring | ditto | base of new pseudobulb | when growth is partly finished | winter | very little | Warm Intermediate |
| ditto | ditto | base and side of newly made pseudobulb | ditto | ditto | ditto | ditto |
| after flowering | spring | side of last made pseudobulb | ditto | ditto | water sparingly | Intermediate |
| after flowering | winter | side of last made pseudobulb | ditto | ditto | water sparingly | Intermediate |
| after flowering | summer | side of last made pseudobulb | ditto | ditto | water sparingly | Intermediate |
| after flowering | spring | side of last made pseudobulb | ditto | ditto | water sparingly | Intermediate |
| ditto | spring | side of last made pseudobulb | ditto | ditto | ditto | Warm or Intermediate |
| ditto | summer | side of last made pseudobulb | ditto | ditto | ditto | Warm or Intermediate |
| ditto | autumn | side of last made pseudobulb | ditto | ditto | ditto | Intermediate |
| ditto | spring | side of last made pseudobulb | ditto | ditto | ditto | Warm |
| ditto | summer | side of last made pseudobulb | ditto | ditto | ditto | Intermediate |
| ditto | winter | side of last made pseudobulb | ditto | ditto | ditto | Warm |
| directly after flowering | summer | side of last made pseudobulb | ditto | ditto | ditto | Intermediate |
| directly after flowering | spring | side of last made pseudobulb | ditto | ditto | ditto | Warm |
| directly after flowering | winter | side of last made pseudobulb | ditto | ditto | ditto | Intermediate |

which can easily be gleaned by the requirements of their parents. The following are mentioned in some are marked Warm, Intermediate, and Cool, Cyripediums are really not so impatient in this respect as
 † Flowers every alternative year, instead of making a pseudobulb.

| best time to repot or top-dress | The usual time of blooming | From whence flower spikes appear, and whether on old or new growth | Whether showing spike directly growth is finished or otherwise | The proper resting period, if any | Amount of water at the roots when resting | Whether to winter or rest in Cool, Intermediate or Warm House |
|---------------------------------|----------------------------|---|--|-----------------------------------|---|---|
| directly after flowering | spring | centre of last formed growth | when growth is finished | never inactive | water sparingly in winter | Warm |
| | winter | | | | | |
| ditto | summer | from, and simultaneously with, new growth sides of previous year's pseudobulb | when starting to grow | winter | very little indeed | ditto |
| | winter | | | | | |
| spring | spring | on last made pseudobulb | after rest | ditto | very little | Warm |
| May | autumn | new pseudobulb | before rest | | | |
| spring | spring | previous year's pseudobulb | after rest | ditto | very little | Intermediate |
| early spring | autumn | new pseudobulb | before rest | | | |
| spring | spring | old pseudobulb | after rest | ditto | very little | Intermediate |
| summer | autumn | new pseudobulb | before rest | | | |
| spring | spring | previous year's pseudobulb | after rest | ditto | very little | Warm |
| | winter and spring | new pseudobulb | before rest | | | |
| May | spring | previous year's pseudobulb | after rest | ditto | very little | Intermediate |
| | winter and spring | new pseudobulb | before rest | | | |
| spring | spring | previous year's pseudobulb | after rest | ditto | very little | Warm |
| | winter and spring | new pseudobulb | before rest | | | |
| about May | May | previous year's pseudobulb | after rest | ditto | very little | Intermediate |
| | winter and spring | new pseudobulb | before rest | | | |
| spring | spring | old pseudobulb | after rest | ditto | very little | Warm |
| summer | autumn | new pseudobulb | before rest | | | |
| spring | spring | previous year's pseudobulb | after rest | ditto | very little | Intermediate |
| | winter and spring | new pseudobulb | before rest | | | |
| spring | spring | old pseudobulb | after rest | ditto | very little | Warm |
| | autumn | new pseudobulb | before rest | | | |
| spring | spring | previous year's pseudobulb | after rest | ditto | very little | Intermediate |
| | winter and spring | new pseudobulb | before rest | | | |
| spring | spring | old pseudobulb | after rest | ditto | very little | Warm |
| | autumn | new pseudobulb | before rest | | | |
| spring | spring | previous year's pseudobulb | after rest | ditto | very little | Intermediate |
| | winter and spring | new pseudobulb | before rest | | | |
| spring | spring | old pseudobulb | after rest | ditto | very little | Warm |
| | autumn | new pseudobulb | before rest | | | |

| NAMES OF PLANTS | Page | Whether to grow in Cool, Intermediate, or Warm House | Whether preferring a shady, sunny, or partial sunny position | Whether best grown in baskets or pans and suspended, or in pots on the stage | The most suitable compost |
|----------------------------------|------|--|--|--|---------------------------|
| DENDROBIUM THYRSIFLORUM | 106 | Warm | partial | pots or baskets | peat and sphagnum |
| — TORTILE | .. | | | pans or baskets | |
| — TRANSPARENS | .. | | | pans or baskets | |
| — WARDIANUM | 126 | | | | |
| DISA GRANDIFLORA | 85 | Cool frame | shady | pots | peat, sphagnum and sand |
| EPIDENDRUM ATROPURPUREUM | .. | Intermediate | sunny | pans or baskets | peat, sphagnum and sand |
| — BICOENUTUM | .. | Warm | partial | | |
| — NEMORALE | .. | | sunny | | |
| — X O'BRIENIANUM | .. | Intermediate | partial | pots | peat and sphagnum |
| — PRISMATOCARPUM | .. | | | | |
| — VITELLINUM | 85 | Cool | shady | pots or baskets | |
| — WALLISII | 134 | Intermediate | partial | pots | peat, loam and sphagnum |
| EULOPHIA GUINEENSIS | .. | Warm | ditto | pans or baskets | |
| GALEANDRA DEVONIANA | .. | Intermediate | ditto | ditto | |
| — NIVALIS | .. | Warm | | | peat and sphagnum |
| HABENARIA CAERNEA | .. | ditto | ditto | ditto | peat, sphagnum and loam |
| — MILLARIS | .. | | | | peat and sphagnum |
| HOULLETIA BROCKLEHURSTIANA | .. | Intermediate | ditto | ditto | |
| LÆLIA ALBIDA | 185 | ditto | sunny | baskets or pots | ditto |
| — ANCEPS | 106 | | | | |
| — AUTUMNALIS | 109 | | | | |
| — BOOTHIANA | .. | | | | |
| — CINNABARINA | 134 | | partial | | |
| — CRISPA | .. | | sunny | | |
| — DAYANA | 138 | Cool | partial | pans or baskets | |
| — DIGBYANA | .. | Warm | sunny | pots or baskets | |
| — X ELEGANS | 135 | Intermediate | partial | pots or baskets | ditto |
| — FLAVA | .. | | sunny | pans or baskets | |
| — FURFURACEA | .. | Warm | partial | pans or baskets | ditto |
| — GLAUCA | .. | | sunny | pots or baskets | |
| — HARPOPHYLLA | 182 | | | pans or baskets | |
| — MAJALIS | .. | Intermediate | partial | pans or baskets | ditto |
| — PERRINII | .. | | | pans or baskets | |
| — PURPURATA | 109 | | | pans or baskets | |
| — SUPERBIENS | .. | | | | |
| — TENEBROSA | .. | | | | |
| — XANTHINA | .. | | | | |
| LEPTOTES BICOLOR | .. | ditto | ditto | pans, baskets or blocks | ditto |
| LYCASTE AROMATICA | 138 | ditto | ditto | pots or baskets | ditto |
| — ORIENTA | .. | | | | |
| — DEPPII | 138 | | | | |
| — GIGANTEA | .. | | | | |
| — FLAVA | .. | | | | |
| — SKINNERI | 110 | | | | |

| The best time to repot or top-dress | The usual time of blooming | From whence flower spikes appear, and whether on old or new growth | Whether showing spike directly growth is finished or otherwise | The proper resting period, if any | Amount of water at the roots when resting | Whether to winter or rest in Cool, Intermediate or Warm House | |
|--|--------------------------------------|--|--|--------------------------------------|---|---|------------------------|
| spring | { spring May winter and spring | { previous year's pseudobulb new pseudobulb | { after rest | { winter | { very little | { Intermediate | |
| { May November or spring | | | | | | | |
| immediately after flowering | August | centre of new growth | on completion of growth | { growing steadily throughout winter | water very moderately | Cool | |
| spring | { summer | { top of new growth | after short rest | winter | very little | { Intermediate Warm | |
| summer | | | { when growth is finished never inactive | water moderately | | | |
| { spring | winter | | after short rest | winter | very little | { Intermediate | |
| after flowering | { summer | | { on completion of growth after short rest | never inactive | water moderately | | |
| { March or after flowering | | | after rest | winter | very little | Cool | |
| spring | autumn | | { on completion of growth before rest | never inactive | water moderately | { Intermediate Warm | |
| ditto | ditto | base of new growth | before rest | winter | very little | Warm | |
| ditto | ditto | top of new pseudobulb | ditto | ditto | ditto | { Intermediate Warm | |
| ditto | ditto | centre of new growth | ditto | ditto | ditto | ditto | |
| after flowering | spring | base of new pseudobulb | after rest | ditto | ditto | Intermediate | |
| { spring | winter | { top of new bulb | { before rest | { ditto | { ditto | { ditto | |
| { spring or August spring | summer | | | | | | |
| after flowering | spring | | after rest | { never inactive | water moderately | { Warm | |
| { spring | autumn | | before rest | { winter | { water carefully | | { Intermediate Warm |
| | spring | | after rest | | | | |
| | { spring or autumn spring | | before rest | | | | |
| | winter | | after rest | | | | |
| after flowering | spring | | after rest | | | | |
| after flowering | summer | | { before rest | { never inactive | { water carefully | { Intermediate | |
| spring | summer | | | | | | |
| after flowering | summer | | | | | | |
| ditto | spring | ditto | after rest | winter | very little | ditto | |
| { directly new growth commences or after flowering | summer | { base of new bulb | { simultaneously with new growth | { ditto | { ditto | { ditto | |
| after flowering | early spring | | | | | | |
| after flowering | spring | | | | | | |

[illegible]

[illegible]

| NAMES OF PLANTS | Page | Whether to grow in Cool, Intermediate, or Warm House | Whether preferring a shady, sunny, or partial sunny position | Whether best grown in baskets or pans and suspended, or in pots on the stage | The most suitable compost |
|--|------|--|--|--|------------------------------------|
| ODONTOGLOSSUM X BUCKERIANUM | .. | Cool | shady | pots | peat and sphagnum |
| — TRIPUDIANUS | .. | | | | |
| — TRIUMPHANS | 79 | | | | |
| — URO-SKINNERI | .. | Warm | partial | baskets baskets or pots | |
| ONCIDIUM AMPLIATUM | .. | | | | |
| — CAVENDISHIANUM | 141 | Cool | shady | baskets or pans | |
| — CREISOPHORUM | .. | | | | |
| — CONCOLOR | .. | | | | |
| — CRISPUM | .. | Warm | shady | pots baskets or pans | |
| — CUCULLATUM | .. | | | | |
| — CURTUM | .. | Cool | shady | baskets or pans | |
| — FLEXUOSUM | 142 | | | | |
| — FORBESII | 131 | Intermediate | sunny | baskets or pots | |
| — HASTATUM | .. | | | | |
| — JONESIANUM | .. | Warm | shady | blocks or baskets | ditto |
| — KRAMERIANUM | 141 | | | | |
| — LANCEANUM | .. | Cool | shady | baskets or pots | |
| — LURIDUM | .. | | | | |
| — MACRANTHUM | 80 | Intermediate | shady | baskets or pots | |
| — MARSHALLIANUM | 130 | | | | |
| — ORNITHORHYNCHUM | 131 | Warm | partial | baskets or pots | |
| — PAPILIO | 127 | | | | |
| — SARCODES | .. | Intermediate | partial | pots | |
| — SPHACELATUM | .. | | | | |
| — SPLENDIDUM | .. | Cool | shady | baskets or pans | |
| — TIGRINUM | 80 | | | | |
| — VARICOSUM | 83 | Warm | ditto | ditto | ditto |
| PAPHINIA CRISTATA | .. | | | | |
| — GRANDIFLORA | .. | ditto | partial | pots | { peat, sphagnum and loam |
| PERISTERIA ELATA | 142 | | | | |
| PESCATOREAS | .. | ditto | shady | baskets or pots | sphagnum |
| PHAIUS GRANDIFOLIUS | 127 | | | | |
| — TUBERCULOSUS | .. | ditto | ditto | baskets or pots | { peat, sphagnum and loam |
| — WALLICHII | .. | | | | |
| PHALÆNOPSIS AMABILIS (<i>syn. GRANDIFLORA</i>) | .. | ditto | ditto | pots | { peat, sphagnum and loam |
| — APHRODITE | .. | | | | |
| — LURIDEMANNIANA | .. | ditto | ditto | baskets | sphagnum |
| — SANDERIANA | .. | | | | |
| — SCHILLERIANA | 126 | Intermediate | partial | pots or baskets | peat and sphagnum |
| — SPECIOSA | .. | | | | |
| — STUARTIANA | .. | Warm | ditto | ditto | ditto |
| — VIOLACEA | .. | | | | |
| PILUMNA FRAGRANS | 137 | Warm | ditto | ditto | ditto |
| PLATYCLINIS COBBIANA | .. | | | | |
| — FILIFORMIS | .. | Warm | ditto | ditto | ditto |
| — GLUMACEA | .. | | | | |

| The best time to repot or top-dress | The usual time of blooming | From whence flower spikes appear, and whether on old or new growth | Whether showing spike directly growth is finished or otherwise | The proper resting period, if any | Amount of water at the roots when resting | Whether to winter or rest in Cool, Intermediate or Warm House |
|--|---|--|--|-----------------------------------|---|---|
| when growth is starting, from March until September summer | { winter and spring early spring autumn summer | { base of new pseudobulb | before rest | never inactive | Water sparingly in winter | Cool |
| { spring | { winter autumn and winter late spring summer spring | { base of new bulb | | | | { Warm Intermediate |
| { summer autumn | { summer | | | | | { Cool |
| { summer | { autumn | | | | | { Warm Cool |
| { spring | { summer | | | | | { Intermediate |
| { summer | { various | | spikes are produced shortly after pseudobulb is completed | a short rest whenever inactive | if growing, or otherwise, water sparingly during winter | { Warm |
| { spring | { summer | from new growth | | | | { Cool |
| { summer spring or autumn | { winter | | | | | { Intermediate |
| | { various | | | | | { Warm |
| { spring | { spring | base of new bulb | | | | { Intermediate Warm |
| | { autumn | | | | | { Cool |
| ditto | ditto spring | ditto | ditto | ditto | ditto | Warm |
| ditto | summer | ditto | after rest | winter | very little | ditto |
| after flowering | ditto | base of last made growth | when growth is completed | never inactive | { water carefully in winter | ditto |
| early spring | { early spring | { base of new bulb | soon after bulb is completed | a short rest whenever inactive | water sparingly | ditto |
| spring | { spring | | | | | |
| summer | { autumn and winter spring autumn winter spring winter summer | { axil of leaves | when last leaf has formed | a short rest after flowering | ditto | ditto |
| spring | | | | | | |
| ditto | spring | ditto | after rest | winter | ditto | Intermediate |
| ditto | summer | centre of new growth | ditto | ditto | ditto | ditto |

| NAMES OF PLANTS | Page | Whether to grow in Cool, Intermediate, or Warm House | Whether preferring a shady, sunny, or partial sunny position | Whether best grown in baskets or pans and suspended, or in pots on the stage | The most suitable compost |
|---------------------------------|------|--|--|--|---------------------------|
| PLEIONE HUMILIS | 131 | Cool | partial | | |
| — LAGENARIA | 132 | Cool or Intermediate | sunny | pans or baskets | peat, sphagnum and loam |
| — MACULATA | | | | | |
| — WALLICHIANA | | | | | |
| — REICHENBACHIANA | | | | | |
| RESTREPIA ANTENNIFERA | | with Masdevallias | shady | ditto | peat and moss |
| — ELEGANS | | | | | |
| SACCOLABIUM AMPULLACEUM | | | | | |
| — BELLINUM | | | | baskets | |
| — BLUMMI | 139 | Warm | ditto | baskets or pots | sphagnum moss |
| — CURVIFOLIUM | | | | baskets | |
| — GIGANTEUM | | | | baskets or pots | |
| — VIOLACEUM | | | | | |
| SCHOMBURGKIA SUPERBIENS | | Intermediate | sunny | pots | peat and sphagnum |
| — TIBICINIS | | | | baskets | |
| SOBRALIA LILIASTRUM | | ditto | partial | pots | loam and peat |
| — MACRANTHA | 111 | | | | |
| — XANTHOLEUCA | 138 | | | | |
| SOPHRONITIS GRANDIFLORA | 83 | Cool Intermediate | shady | baskets or pans | peat and sphagnum |
| — VIOLACKA | | | | | |
| SPATHOGLOTTIS AUREA | | Warm | partial | baskets or pots | peat, sphagnum and loam |
| — FORTUNEI | | | | | |
| — VIEILLARDI | | | | | |
| STANHOPEA Eburnea | | | | | |
| — INIGNIS | 142 | ditto | ditto | baskets | peat and sphagnum |
| — OCULATA | 142 | | | | |
| — TIGRINA | 128 | | | | |
| STENIAS | | ditto | shady | baskets or pots | sphagnum |
| THUNIA ALBA | | Intermediate | sunny | pots | peat, sphagnum and loam |
| — BENSONIÆ | | | | | |
| — MARSHALLIANA | 112 | | | | |
| TRICHOPILLIA CRISPA | | | | | |
| — MARGINATA | | ditto | partial | pots or baskets | peat and sphagnum |
| — SUAVIS | 187 | | | | |
| — TORTILIS | | | | | |
| TRICHOSMA SUAVIS | | ditto | ditto | ditto | ditto |
| VANDA AMESIANA | | rather warmer than Intermediate | | ditto | |
| — CERULEA | 137 | | | | |
| — CERULESCENS | | | | | |
| — INSIGNIS | | Intermediate | ditto | pots | sphagnum moss |
| — KIMBALLIANA | 84 | Cool | | baskets | |
| — SANDERIANA | | Intermediate | | pots or baskets | |
| — SUAVIS | 137 | | | pots | |
| — TERRES | | Warm | sunny | blocks | |
| WARSCEWICZELLAS | | ditto | shady | baskets or pots | ditto |
| ZYGOPETALUM × CLAYI | | | | | |
| — CRINITUM | | Intermediate | partial | pots | peat and loam |
| — MACRAYI | 113 | | | | |
| — MAXILLARE | | | | rafts or baskets | peat and sphagnum |

| The best time to repot or top-dress | The usual time of blooming | From whence flower spikes appear, and whether on old or new growth | Whether showing spike directly growth is finished or otherwise | The proper resting period, if any | Amount of water at the roots when resting | Whether to winter or rest in Cool, Intermediate or Warm House |
|--|--|--|--|-----------------------------------|---|---|
| directly after flowering | winter autumn | centre of new growth | after rest | never inactive | water sparingly during winter | Cool Intermediate |
| spring | summer | top of new and old pseudobulb | ditto | ditto | ditto | Intermediate, or with Masdevallias |
| early spring | ditto spring summer | from stem or axil of the 3rd or 4th leaf from the top | ditto | never entirely inactive | ditto | Warm |
| spring | winter autumn and winter early summer | top of new pseudobulb | before rest after short rest | winter | very little | warm Intermediate |
| after flowering | summer | top of new stems | ditto | never inactive | water sparingly during winter | Intermediate |
| spring | winter | top of new pseudobulb | before rest | short time after flowering | ditto | warm end of Cool house |
| when starting to grow, usually in spring | usually during the summer | base of last made pseudobulb | when growing again | winter | ditto | Warm |
| early spring | usually during the late summer months | ditto | ditto | ditto | very little | ditto |
| after flowering | summer | base of last made growth | when growth is completed | never inactive | water carefully in winter | ditto |
| early spring | ditto | top of new pseudobulb | before rest | winter | very little indeed | Intermediate |
| after flowering | late spring spring | base of last made pseudobulb | after rest | ditto | very little | ditto |
| spring | late spring early spring | top of last made pseudobulb | after short rest | ditto | ditto | ditto |
| ditto | spring autumn spring | from stem or axil of the 3rd or 4th leaf from top | ditto | winter, requires but little rest | water sparingly during winter | rather warmer than Intermediate |
| after flowering | late spring late summer spring summer | base of last made growth | when growth is completed | winter never inactive | very little water carefully in winter | Intermediate Warm ditto |
| early spring | various winter various | base of new growth | after short rest | ditto | water sparingly during winter | Intermediate |

QUESTIONS AND ANSWERS.

R. L., SOUTH WALES, asks :—What is the proper treatment of *Odontoglossum crispum*? I have been told that, like many other Cool Orchids, it requires only a cool frame to grow in and does well when planted out, but under cold frame treatment the leaves of my plants are turning yellow and the plants appear to be dying.

REPLY.—The attempt to grow Orchids in a cold frame or pit invariably ends in wretched failure, and could only be done with any chance of success by someone who thoroughly understands the treatment they require. For a few months during the summer *Odontoglossums* will do fairly well in a frame facing the north if they are in pots and placed on a stage or inverted flower pots. The planting-out system is a wrong one, and when done the plants should be taken up in March or April and place them in rather small pots, when they get established quicker than in large ones.

D. A. asks :—I should much like to know the proper time of the year when *Lælia purpurata* should be repotted, and what is the best compost to grow it in? Also the best way to make established plants of newly imported *Odontoglossum crispum*.

REPLY.—*Lælia purpurata* should be repotted any time immediately after it has done flowering, which is about the beginning of June, and then it will again start into growth. The plants always shrivel more or less after repotting, according to its state of health, but soon recover. Repot the plants about once in two or three years, the pots well drained to half their depth, using clean crocks, larger ones at the bottom with smaller at the top. Then pot in fibrous peat and sphagnum moss in equal proportions.

The best way to establish newly imported *Odontoglossum crispum* is at first to treat them very carefully, otherwise many may not recover from their long journey, being generally in a very shrivelled condition. Directly the plants are received all dead leaves and old useless matter should be cut away and decayed roots trimmed, the plants then placed upon a layer of damp sphagnum moss placed on the stage of a cool house, placing them one against the other in an upright position. The moss must be kept moist, avoiding watering the plants overhead until reaction has set in. When the bulbs have plumped up and new roots begin to push out from the base, then pot the plants in the usual compost of peat and sphagnum, in rather small pots, and then treat as established plants. The plan of placing newly imported Orchids in dark places under the stage, or suspending them head downwards, as is sometimes done, cannot be too strongly condemned. The plants, however, should be protected from strong light for the first few days until they are more accustomed to it.

A. B., NORTH DEVON, writes :—I should very much like to see in print a reply dealing fully with the hygrometer; for instance, should it not always

register over saturation point in the *Odontoglossum* house? In such a house with a north aspect it is a simple matter (at least in winter) to remain at saturation point, and that does not seem to me to be moisture enough in the air for this class of plants, as they dry so quickly, owing I suppose to the amount of ventilation they get. Then the *Cattleya* house seems to me to do better when never quite reaching saturation point. Here we live on the top of a hill, and the air is very pure and the sunlight strong. The *Cattleya* house to-day (January 8th) has reached 90° of sun heat, and it is impossible to ventilate too freely as there is a cold north wind; of course the hygrometer under such conditions registered about 8° or 9° of dry heat. It would be a great help if you could let me know what is best to be done under such circumstances. I do not like to shade yet, as I imagine sun heat is so very beneficial just now to the *Dendrobies*, which are resting in the *Cattleya* house. The East India house, where I keep most of the *Cypripediums*, never ranges more than 3° from saturation point, and being next to the *Odontoglossum* house it does not get so much sun as the *Cattleya* house. I have used leaves on the lower stage as you recommend, and I have a long narrow tank containing four inch pipes and is kept full of water to counteract the effects of the large hot water pipes above, so that I have moisture above and below the hot water pipes, also a huge tank along the centre of each house below the centre stage; still I find it hard work in bright weather to keep the *Cattleya* house at all moist. If you could state the variations near about what the hygrometer should register for the different months, it would be a great help to many.

REPLY.—The hygrometer is an instrument, the want of which in the cultivation of plants is so little felt amongst gardeners that very few possess them, and with that few the hygrometer may often be seen doing duty as a thermometer only, the wet bulb not being kept supplied with moisture. It is difficult to get the atmosphere beyond saturation point, and it is not advisable to try to do so. In the *Odontoglossum* house saturation point should be generally attained, or the nearer to it the better during the spring, summer, and autumn months. It is not possible to maintain it if the house is properly ventilated, and the hygrometer will stand about 3° below saturation point. In the winter it is easy to keep the cool house at saturation, but it is better if it remains for the greater part of the time at 1° or 2° below. In the other houses damp down freely, but the hygrometer will never stop at saturation long, nor is it advisable. Air is an important factor as well as moisture, and when air is admitted properly the wet bulb will stand at from 3° to 5° below the dry one; if lower, then there is not enough moisture in the house. In these houses during the winter I always damp down when the hygrometer shows 3° to 5° of evaporation, unless for a short time at mid-day. If the directions given in the Calendar of Operations for each month are acted upon, the hygrometer should register these figures. Water tanks are invaluable for the storage of rain water, but practically a body of water is useless for producing moisture unless made, by the aid of hot water pipes running through it, warmer than the temperature of the house. ³Then moisture is produced in the form of steam, but this is a method I do not recommend, for if not managed very carefully too much steam is generated, which is very injurious. The best way to cause evaporation is to frequently syringe the paths, stages, and wall.

| NAMES OF PLANTS | Page | Whether to grow in Cool, Intermediate, or Warm House | Whether preferring a shady, sunny, or partial sunny position | Whether best grown in baskets or pans and suspended, or in pots on the stage | The most suitable compost | |
|----------------------------------|------|--|--|--|---------------------------|-------|
| DENDROBIUM THYRSIFLORUM | 105 | Warm | partial | { pots or baskets | { peat and sphagnum | |
| — TORTILE | .. | | | { pans or baskets | | |
| — TRANSPARENTS | .. | | | { pots or baskets | | |
| — WARDIANUM | 126 | | | | | |
| DISA GRANDIFLORA | 85 | Cool frame | shady | pots | { peat, sphagnum and sand | |
| EPIDENDRUM ATROPURPUREUM | .. | { Intermediate | sunny | { pans or baskets | { peat and sphagnum | |
| — BICORNUTUM | .. | Warm | partial | | | |
| — MEMORALE | .. | | sunny | | | |
| — X O'BRIENIANUM | .. | { Intermediate | partial | pots | { peat and sphagnum | |
| — PRISMATOCARPUM | .. | | | { pots or baskets | | |
| — VITELLINUM | 85 | Cool | | { pots or baskets | | |
| — WALLISII | 134 | { Intermediate | partial | pots | { peat, loam and sphagnum | |
| EULOPHIA GUINEENSIS | .. | Warm | ditto | { pans or baskets | | |
| GALEANDRA DEVONTIANA | .. | { Intermediate | ditto | ditto | | |
| — NIVALIS | .. | Warm | | | { peat and sphagnum | |
| HABENARIA CARNEA | .. | { ditto | | ditto | { peat, sphagnum and loam | |
| — MILLARIS | .. | { ditto | | ditto | | |
| HOULETTIA BROCKLEHURSTIANA | .. | { Intermediate | | ditto | | ditto |
| LÆLIA ALBIDA | 135 | { ditto | sunny | { baskets or pots | { ditto | |
| — ANCEPS | 106 | | | | | |
| — AUTUMNALIS | 109 | | | | | |
| — BOOTHIANA | .. | { ditto | partial | { pans or baskets | { ditto | |
| — CINNABARINA | 134 | | | | | |
| — CRISPA | .. | | | | | |
| — DAYANA | 138 | { Cool | sunny | { pans or baskets | { ditto | |
| — DIGBYANA | .. | | | | | |
| — X ELEGANS | 135 | | | | | |
| — FLAVA | .. | { Intermediate | sunny | { pans or baskets | { ditto | |
| — FURFURACEA | .. | | | | | |
| — GLAUCA | .. | | | | | |
| — HARPOPHYLLA | 182 | Warm | sunny | { pots or baskets | { peat and sphagnum | |
| — MAJALIS | .. | { Intermediate | partial | { pans or baskets | | |
| — PERRINII | .. | | | { pots or baskets | | |
| — PURPURATA | 109 | | | { pots or baskets | { ditto | |
| — SUPERBIENS | .. | | | { pans, baskets or blocks | | |
| — TENEBROSA | .. | | | | | |
| — XANTHINA | .. | | | | | |
| LEPTOTES BICOLOR | .. | ditto | ditto | { pans, baskets or blocks | ditto | |
| LYCASTE AROMATICA | 138 | { ditto | ditto | { pots or baskets | { ditto | |
| — ORUENTA | .. | | | | | |
| — DEPPEI | 138 | | | | | |
| — GIGANTEA | .. | | | | | |
| — PLANA | .. | | | | | |
| — SKINNERI | 110 | | | | | |

| The best time to repot or top-dress | The usual time of blooming | From whence flower spikes appear, and whether on old or new growth | Whether showing spike directly growth is finished or otherwise | The proper resting period, if any | Amount of water at the roots when resting | Whether to winter or rest in Cool, Intermediate or Warm House |
|--|----------------------------|--|--|------------------------------------|---|---|
| spring | spring | previous year's pseudobulb | after rest | winter | very little | Intermediate |
| May | | | | | | |
| November or spring | May winter and spring | new pseudobulb | | | | |
| immediately after flowering | August | centre of new growth | on completion of growth | growing steadily throughout winter | water very moderately | Cool |
| spring | summer | | after short rest | winter | very little | Intermediate |
| summer | | | when growth is finished | never inactive | water moderately | |
| spring | winter | top of new growth | after short rest | winter | very little | Intermediate |
| after flowering | | | on completion of growth | never inactive | water moderately | |
| March or after flowering | summer | | after short rest | | | |
| spring | autumn | | after rest | winter | very little | Cool |
| ditto | ditto | base of new growth | on completion of growth | never inactive | water moderately | Intermediate |
| ditto | ditto | top of new pseudobulb | before rest | winter | very little | Warm |
| ditto | ditto | centre of new growth | ditto | ditto | ditto | Intermediate |
| after flowering | spring | base of new pseudobulb | after rest | ditto | ditto | Intermediate |
| spring | winter | | before rest | ditto | ditto | ditto |
| spring or August | summer | | | | | |
| after flowering | spring | | | | | |
| | summer | | after rest | never inactive | water moderately | Warm |
| | autumn | | before rest | | | |
| | spring or autumn | top of new bulb | before rest | | very little | Intermediate |
| | spring | | after rest | | | |
| spring | winter | | before rest | winter | water carefully | Warm |
| | spring | | after rest | | very little | |
| after flowering | summer | | | | | |
| spring | summer | | before rest | | | |
| after flowering | winter | | | never inactive | water carefully | Intermediate |
| | summer | | | | | |
| ditto | spring | ditto | after rest | winter | very little | ditto |
| directly new growth commences or after flowering | summer | base of new bulb | simultaneously with new growth | ditto | ditto | ditto |
| after flowering | early spring | | | | | |
| | spring | | | | | |

| NAMES OF PLANTS | Page | Whether to grow in Cool, Intermediate, or Warm House | Whether preferring a shady, sunny, or partial sunny position | Whether best grown in baskets or pans and suspended, or in pots on the stage | The most suitable compost |
|--|------|--|--|--|---------------------------|
| MASDEVALLIA AMABILIS | 131 | Cool | shady | pans or pots | peat and sphagnum |
| — <i>X CHELSONI</i> | 131 | Interme- diate | | baskets | |
| — <i>CHIMERA</i> | .. | .. | | pans or baskets | |
| — <i>SHUTTLEWORTHII</i> | 131 | .. | | pots | |
| — <i>HARRYANA</i> | 84 | .. | | pans | |
| — <i>DAVISII</i> | .. | .. | | or pots | |
| — <i>HOUTTEANA</i> | .. | Cool | | pans or baskets | |
| — <i>IGNEA</i> | 84 | .. | | pans | |
| — <i>POLYSTICTA</i> | .. | .. | | or pots | |
| — <i>RICHTERBACHIANA</i> | .. | .. | | pans or baskets | |
| — <i>ROSEA</i> | .. | .. | ditto | pans | ditto |
| — <i>SCHLIMII</i> | .. | .. | | or pots | |
| — <i>TOVARENSIS</i> | 136 | Interme- diate | | pots | |
| — <i>VEITCHIANA</i> | 84 | .. | | pans or baskets | |
| — <i>WAGENERIANA</i> | .. | .. | | pots | |
| MAXILLARIA GRANDIFLORA | 85 | Cool | | pots | |
| — <i>SANDERIANA</i> | .. | Interme- diate | | pots or baskets | |
| — <i>VENUSTA</i> | 132 | Cool | | .. | |
| MILTONIA CLOWESII | .. | Interme- diate | ditto | pans, baskets or pots | ditto |
| — <i>PHALENOPSIS</i> | .. | .. | | .. | |
| — <i>ROEZLII</i> | 140 | Warm | | .. | |
| — <i>SPECTABILIS</i> | .. | Interme- diate | | .. | |
| — <i>VEILLARIA</i> | 110 | Warm | | .. | |
| — <i>WARSCWICZII</i> | .. | .. | | .. | |
| MORMODES LUXATUM | .. | .. | | pans or baskets | |
| — <i>EBURNEUM</i> | .. | ditto | | .. | |
| — <i>PARDINUM</i> | 142 | .. | | .. | |
| ODONTOGLOSSUM X ANDERSONIANUM | .. | .. | | pots | |
| — <i>BICTONIENSE</i> | 129 | Cool | shady | .. | ditto |
| — <i>BLANDUM</i> | 130 | .. | | pans | |
| — <i>CERVANTESII</i> | 79 | Interme- diate | | pots | |
| — <i>CIRRHOSUM</i> | .. | .. | | baskets | |
| — <i>CITROSUM</i> | 104 | .. | | pots | |
| — <i>X CORADINEI</i> | .. | .. | | .. | |
| — <i>CORDATUM</i> | 130 | .. | | baskets | |
| — <i>OCRONARIUM</i> | .. | Cool | | .. | |
| — <i>CRISPUM</i> | 76 | Interme- diate | | .. | |
| — <i>EDWARDII</i> | 129 | .. | | .. | |
| — <i>GRANDE</i> | .. | Cool | shady | pots | ditto |
| — <i>HALLII</i> | 129 | .. | | .. | |
| — <i>HARRYANUM</i> | .. | Interme- diate | | .. | |
| — <i>HASTILABUM</i> | .. | .. | | .. | |
| — <i>INSLEAYI LEOPARDINUM</i> | .. | .. | | .. | |
| — <i>SPLENDENS</i> | .. | .. | | .. | |
| — <i>LINDLEYANUM</i> | .. | .. | | .. | |
| — <i>LUTEO-PURPUREUM</i> | 129 | .. | | .. | |
| — <i>MACULATUM</i> | 130 | Cool | | .. | |
| — <i>NEBULOSUM</i> | 130 | .. | | .. | |
| — <i>ODORATUM</i> | .. | .. | shady | pans or baskets | ditto |
| — <i>PESCATOREI</i> | 79 | .. | | .. | |
| — <i>POLYXANTHUM</i> | .. | .. | | .. | |
| — <i>PULCHELLUM</i> | .. | .. | | .. | |
| — <i>RAMOSISSIMUM</i> | .. | .. | | .. | |
| — <i>ROSSII MAJUS</i> | .. | .. | | .. | |

| The best time to repot or top-dress | The usual time of blooming | From whence flower spikes appear, and whether on old or new growth | Whether showing spike directly growth is finished or otherwise | The proper resting period, if any | Amount of water at the roots when resting | Whether to winter or rest in Cool, Intermediate or Warm House |
|---|--|--|--|--------------------------------------|---|---|
| February, or after flowering | spring and summer | base of last made leaves | simultaneously with new growth | never inactive | water carefully in winter | Warm end of Cool or Intermediate |
| spring after flowering | winter and spring spring and summer autumn and winter | base of new pseudobulb | ditto | ditto | ditto | Intermediate |
| spring | autumn and winter | | | | | |
| ditto | autumn | | | | | ditto |
| after flowering | late winter various | base of last made pseudobulb | ditto | ditto | water sparingly during winter | Warm Intermediate Warm |
| spring | summer | base of newly forming pseudobulb | before rest | winter | very little | Intermediate |
| | spring autumn spring winter spring summer various | base of last made pseudobulb | ditto | never inactive winter never inactive | water sparingly in winter | Cool Intermediate |
| | spring | centre of new growth base of last made pseudobulb base of previous year's pseudobulb | after rest | winter never inactive autumn | very dry water sparingly very dry | Cool |
| | various early spring early autumn winter and spring early autumn summer late autumn various winter and spring spring summer spring various | | | | | |
| when growth is starting, from March until September | base of last made pseudobulb | | | never inactive winter | water sparingly very little | Intermediate Cool |
| | base of last made pseudobulb | | | never inactive | water sparingly | Intermediate |
| | side of new growth | | before rest | winter never inactive autumn | very little water sparingly in winter | Cool |
| | base of new pseudobulb | | | never inactive | | |
| | side of new growth base of new pseudobulb | | | | | |

| NAMES OF PLANTS | Page | Whether to grow in Cool, Intermediate, or Warm House | Whether preferring a shady, sunny, or partial sunny position | Whether best grown in baskets or pans and suspended, or in pots on the stage | The most suitable compost |
|---|------|--|--|--|---------------------------|
| MASDEVALLIA AMABILIS | 131 | Cool | shady | pans or pots | peat and sphagnum |
| — X CRELSONI | 131 | Interme- diate | | baskets | |
| — CHIMERA | 131 | | | pans or baskets | |
| — SHUTTLEWORTHII | 84 | | | pots | |
| — HARRYANA | 84 | | | pans | |
| — DAVISII | 84 | Cool | | or pots | |
| — HOUTTEANA | 84 | | | pans or baskets | |
| — IGNEA | 84 | | | pans | |
| — POLYSTICTA | 84 | | | or pots | |
| — RICHENBACHIANA | 84 | | | pans or baskets | |
| — ROSEA | 136 | Interme- diate | ditto | pans or pots | ditto |
| — SCHLIMII | 84 | | | pots | |
| — TOVARENSIS | 84 | | | pans or baskets | |
| — VEITCHIANA | 85 | Cool | | pots | |
| — WAGNERIANA | 85 | Interme- diate | | pots | |
| MAXILLARIA GRANDIFLORA | 132 | Cool | | pots or baskets | |
| — SANDERIANA | 132 | Interme- diate | | pots or baskets | |
| — VENUSTA | 132 | Cool | | pans, baskets or pots | |
| MILTONIA CLOWESII | 140 | Interme- diate | sunny | pans or baskets | ditto |
| — PHALENOPSIS | 110 | Warm | | pans | |
| — ROEZLII | 110 | Interme- diate | | pots | |
| — SPECTABILIS | 142 | Warm | | pots | |
| — VEXILLARIA | 129 | ditto | | baskets | |
| — WARSCEWICZII | 129 | ditto | | pots | |
| — MOERMES LUXATUM | 130 | ditto | | baskets | |
| — ESRNEUM | 76 | Cool | | pans | |
| — PARDINUM | 79 | Interme- diate | | pots | |
| — ODONTOGLOSSUM X ANDERSONIANUM | 104 | Cool | | baskets | |
| — BICTONIENSE | 130 | Interme- diate | shady | pots | ditto |
| — BLANDUM | 130 | | | pans | |
| — CERVANTESII | 130 | | | pots | |
| — CIRRHOSUM | 130 | | | baskets | |
| — CITROSUM | 130 | | | pots | |
| — X CORADINEI | 130 | | | baskets | |
| — COORDATUM | 130 | | | pots | |
| — CORONARIUM | 130 | | | baskets | |
| — CRISPUM | 130 | | | pots | |
| — EDWARDII | 130 | | | baskets | |
| — GRANDE | 130 | Interme- diate | shady | pots | ditto |
| — HALLII | 130 | Cool | | pans | |
| — HARRYANUM | 130 | Interme- diate | | pots | |
| — HASTILABIIUM | 130 | | | baskets | |
| — INSLAYI LEOPARDINUM | 130 | | | pots | |
| — SPLENDENS | 130 | | | baskets | |
| — LINDLEYANUM | 130 | | | pots | |
| — LUTEO-PURPUREUM | 130 | | | baskets | |
| — MACULATUM | 130 | | | pots | |
| — NEBULOSUM | 130 | | | baskets | |
| — ODORATUM | 130 | | | pots | |
| — PESCATOREI | 130 | | | baskets | |
| — POLYXANTHUM | 130 | | | pots | |
| — PULCHELLUM | 130 | | | baskets | |
| — RAMOSISSIMUM | 130 | | | pots | |
| — ROSSII MAJUS | 130 | | | baskets | |

ORCHIDS: HOW TO GROW THEM SUCCESSFULLY.

| The best time to repot or top-dress | The usual time of blooming | From whence flower spikes appear, and whether on old or new growth | Whether showing spike directly growth is finished or otherwise | The proper position of the plant | Amount of water to give | Remarks |
|---|--|--|--|----------------------------------|-------------------------|--------------|
| February, or after flowering | spring and summer | base of last made leaves | simultaneously with new growth | new growth | water at once | |
| spring after flowering | winter and spring spring and summer autumn and winter | base of new pseudobulb | ditto | new growth | water at once | |
| spring | autumn and winter | | | | | 6- |
| ditto | late winter various | base of last made pseudobulb | ditto | new growth | water at once | 1 |
| after flowering | summer | | | | | 16- |
| spring | spring | base of newly forming pseudobulb | ditto | new growth | water at once | 1 |
| | spring autumn spring winter spring summer various | base of last made pseudobulb | | | | 11 |
| | spring | centre of new growth | | | | |
| | various | base of last made pseudobulb | | | | |
| | early spring | base of previous year's pseudobulb | | | | 0 |
| when growth is starting, from March until September | early autumn winter and spring early autumn summer late autumn various winter and spring spring summer spring various | base of last made pseudobulb | | | | ditto |
| | spring | | | | | ditto |
| | spring | | | | | Intermediate |
| | spring | | | | | ditto |

| NAMES OF PLANTS | Page | Whether to grow in Cool, Intermediate, or Warm House | Whether preferring a shady, sunny, or partial sunny position | Whether best grown in baskets or pans and suspended, or in pots on the stage | The most suitable compost |
|---|------|--|--|--|-------------------------------|
| ODONTOGLOSSUM × RUCKERIANUM | .. | Cool | shady | pots | peat and sphagnum |
| — TRIPUDIANS | .. | | | | |
| — TRIUMPHANS | 79 | | | | |
| — URO-SKINNERI | .. | Warm | partial | baskets baskets or pots | |
| ONCIDIUM AMPLIATUM | .. | | | | |
| — CAVENDISHIANUM | 141 | Cool | shady | baskets or pans | |
| — CHIROPHORUM | .. | | | | |
| — CONCOLOR | .. | | | | |
| — CRISPUM | .. | Warm | shady | pots | |
| — OCULLATUM | .. | | | | |
| — CURTUM | .. | Cool | sunny | baskets or pans | |
| — FLEXUOSUM | 142 | | | | |
| — FORBESII | 131 | Interme- diate | sunny | baskets or pots | |
| — HASTATUM | .. | | | | |
| — JONESIANUM | .. | Warm | shady | blocks or pots | |
| — KRANERIANUM | 141 | | | | |
| — LANCEANUM | .. | Cool | sunny | baskets | ditto |
| — LURIDUM | .. | | | | |
| — MACRANTHUM | 80 | Interme- diate | shady | pots | |
| — MARSHALLIANUM | 130 | | | | |
| — ORNITHORHYNCHUM | 131 | Warm | partial | baskets or pots | |
| — PAPILIO | 127 | | | | |
| — SARCODES | .. | Interme- diate | partial | pots | |
| — SPHACELATUM | .. | | | | |
| — SPLENDIDUM | .. | Warm | sunny | baskets or pans | |
| — TIGRINUM | 80 | | | | |
| — VARICOSUM | 83 | Cool | shady | baskets or pots | |
| PAPHINIA CRISTATA | .. | | | | |
| — GRANDIFLORA | .. | Warm | ditto | ditto | ditto |
| PERISTERIA ELATA | 142 | | | | |
| PESCATOREAS | .. | ditto | shady | baskets or pots | sphagnum |
| PHAIUS GRANDIFOLIUS | 127 | | | | |
| — TUBERCULOSUS | .. | ditto | ditto | pots | peat, sphagnum and loam |
| — WALLICHII | .. | | | baskets or pots | |
| PHALÆNOPSIS AMABILIS (<i>syn. GRANDIFLORA</i>) | .. | ditto | ditto | baskets | sphagnum |
| — APHRODITE | .. | | | | |
| — LUEDDEMANNIANA | .. | ditto | ditto | pots | |
| — SANDERIANA | .. | | | | |
| — SCHILLERIANA | 126 | Interme- diate | partial | pots or baskets | peat and sphagnum |
| — SPECIOSA | .. | | | | |
| — STUARTIANA | .. | Warm | ditto | ditto | ditto |
| — VIOLACEA | .. | | | | |
| PILUMNA FRAGRANS | 137 | Warm | ditto | ditto | ditto |
| PLATYCLINIS COBBIANA | .. | | | | |
| — FILIFORMIS | .. | Warm | ditto | ditto | ditto |
| — GLUMACEA | .. | | | | |

| The best time to repot or top-dress | The usual time of blooming | From whence flower spikes appear, and whether on old or new growth | Whether showing spike directly growth is finished or otherwise | The proper resting period, if any | Amount of water at the roots when resting | Whether to winter or rest in Cool, Intermediate or Warm House |
|--|--|--|--|-----------------------------------|---|---|
| when growth is starting, from March until September summer | { winter and spring early spring autumn summer | { base of new pseudobulb | { before rest | { never inactive | { Water sparingly in winter | { Cool |
| { spring | { winter | { | { | { | { | { Warm |
| { summer | { autumn and winter | { | { | { | { | { Intermediate |
| { autumn | { late spring summer spring | { | { | { | { | { Cool |
| { summer | { summer | { base of new bulb | { | { | { | { Warm |
| { spring | { autumn | { | { | { | { | { Cool |
| { summer | { summer | { | { | { | { | { Intermediate |
| { spring | { various | { | { spikes are produced shortly after pseudobulb is completed | { a short rest whenever inactive | { if growing, or otherwise, water sparingly during winter | { Warm |
| { summer | { summer | { from new growth | { | { | { | { Cool |
| { spring or autumn | { winter | { | { | { | { | { Intermediate |
| { | { various | { | { | { | { | { Warm |
| { spring | { spring | { base of new bulb | { | { | { | { Intermediate |
| { | { autumn | { | { | { | { | { Warm |
| { | { | { | { | { | { | { Cool |
| ditto | ditto spring | ditto | ditto | ditto | ditto | Warm |
| ditto | summer | ditto | after rest | winter | very little | ditto |
| after flowering | ditto | base of last made growth | when growth is completed | never inactive | { water carefully in winter | ditto |
| early spring | { early spring | { | { | { | { | { |
| spring | { | { base of new bulb | { soon after bulb is completed | { a short rest whenever inactive | { water sparingly | { ditto |
| summer | { spring | { | { | { | { | { |
| { | { autumn and winter | { | { | { | { | { |
| spring | { spring autumn winter spring winter summer | { axil of leaves | { when last leaf has formed | { a short rest after flowering | { ditto | { ditto |
| ditto | spring | ditto | after rest | winter | ditto | Intermediate |
| ditto | summer | centre of new growth | ditto | ditto | ditto | ditto |

| NAMES OF PLANTS | Page | Whether to grow in Cool, Intermediate, or Warm House | Whether preferring a shady, sunny, or partial sunny position | Whether best grown in baskets or pans or suspended, or in pots on the stage | The most suitable compost | | |
|----------------------------------|------|--|--|---|--|--|--|
| PLEIONE HUMILIS | .. | Cool | partial | } pans or baskets | } peat, sphagnum and loam | | |
| — LAGENARIA | 131 | } Cool or Intermediate | } sunny | | | | |
| — MACULATA | 132 | | | | | | |
| — WALLICHIANA | .. | | | | | | |
| — REICHENBACHIANA | .. | | | | | | |
| RESTREPIA ANTENNIFERA | .. | } with Masdevallias | } shady | } ditto | } peat and moss | | |
| — ELEGANS | .. | | | | | | |
| SACCOLABIUM AMPULLACEUM | .. | } Warm | } ditto | } baskets } baskets or pots } baskets } baskets or pots | } sphagnum moss | | |
| — BELLINUM | .. | | | | | | |
| — BLUMI | 139 | | | | | | |
| — CURVIFOLIUM | .. | | | | | | |
| — GIGANTEUM | .. | | | | | | |
| — VIOLACEUM | .. | | | | | | |
| SCHOMBURGKIA SUPERBENS | .. | } Intermediate | } sunny | } pots } baskets | } peat and sphagnum | | |
| — TIBICINIS | .. | | | | | | |
| SOBRALIA LILIASTRUM | .. | } ditto | } partial | } pots | } loam and peat | | |
| — MACRANTHA | 111 | | | | | | |
| — XANTHOLEUCA | 138 | | | | | | |
| NOPEIRONITIS GRANDIFLORA | 83 | } Cool Intermediate | } shady | } baskets or pans | } peat and sphagnum | | |
| — VIOLACKA | .. | | | | | | |
| SPATHOGLOTTIS AUREA | .. | } Warm | } partial | } baskets or pots | } peat, sphagnum and loam | | |
| — FORTUNEI | .. | | | | | | |
| — VIEILLARDI | .. | | | | | | |
| STANHOPEA EBURNEA | .. | } ditto | } ditto | } baskets | } peat and sphagnum | | |
| — INSIGNIS | 142 | | | | | | |
| — OCULATA | 142 | | | | | | |
| — TIGRINA | 128 | | | | | | |
| STENIAS | .. | | | | | | |
| THUNIA ALBA | .. | } Intermediate | } sunny | } pots | } peat, sphagnum and loam | | |
| — BENSONIÆ | .. | | | | | | |
| — MARSHALLIANA | 112 | | | | | | |
| TRICHOPILIA CRISPA | .. | } ditto | } partial | } pots or baskets | } peat and sphagnum | | |
| — MARGINATA | .. | | | | | | |
| — SUAVIS | 137 | | | | | | |
| — TORTILIS | .. | | | | | | |
| TRICHOSMA SUAVIS | .. | } ditto | } ditto | } ditto | } ditto | | |
| VANDA AMESIANA | .. | | | | | | |
| — OERULEA | 137 | } rather warmer than Intermediate | } ditto | } ditto | } sphagnum moss | | |
| — OERULESCENS | .. | | | | | | |
| — INSIGNIS | .. | | | | | | |
| — KIMBALLIANA | 84 | | | | | | |
| — SANDERIANA | .. | } Intermediate | } sunny | } baskets } pots or baskets } pots blocks | } ditto | | |
| — SUAVIS | 137 | | | | | | |
| — TERES | .. | | | | | | |
| WARSCWICZELLAS | .. | } ditto | } shady | } baskets or pots | } ditto | | |
| ZYGOPETALUM × CLAYI | .. | | | | | | |
| — CRINITUM | .. | } Intermediate | } partial | } pots } rafts or baskets | } peat and loam } peat and sphagnum | | |
| — MACKAYI | 113 | | | | | | |
| — MAXILLARE | .. | | | | | | |

| The best time to repot or top-dress | The usual time of blooming | From whence flower spikes appear, and whether on old or new growth | Whether showing spike directly growth is finished or otherwise | The proper resting period, if any | Amount of water at the roots when resting | Whether to winter or rest in Cool, Intermediate or Warm House |
|--|--|--|--|-----------------------------------|---|---|
| directly after flowering | winter autumn | centre of new growth | after rest | never inactive | water sparingly during winter | Cool Intermediate |
| spring | summer | top of new and old pseudobulb | ditto | ditto | ditto | Intermediate, or with Masdevallias |
| early spring | ditto summer | from stem or axil of the 3rd or 4th leaf from the top | ditto | never entirely inactive | ditto | Warm |
| spring | winter autumn winter early summer | top of new pseudobulb | before rest after short rest | winter | very little | warm Intermediate |
| after flowering | summer | top of new stems | ditto | never inactive | water sparingly during winter | Intermediate |
| spring | winter | top of new pseudobulb | before rest | short time after flowering | ditto | warm end of Cool house |
| when starting to grow, usually in spring | usually during the summer | base of last made pseudobulb | when growing again | winter | ditto | Warm |
| early spring | usually during the late summer months | ditto | ditto | ditto | very little | ditto |
| after flowering | summer | base of last made growth | when growth is completed | never inactive | water carefully in winter | ditto |
| early spring | ditto | top of new pseudobulb | before rest | winter | very little indeed | Intermediate |
| after flowering | late spring spring | base of last made pseudobulb | after rest | ditto | very little | ditto |
| spring | late spring early spring | top of last made pseudobulb | after short rest | ditto | ditto | ditto |
| ditto | spring autumn spring | from stem or axil of the 3rd or 4th leaf from top | ditto | winter, requires but little rest | water sparingly during winter | rather warmer than Intermediate |
| after flowering | late spring early spring late summer spring summer | base of last made growth | when growth is completed | winter never inactive | very little water carefully in winter | Warm ditto |
| early spring | various winter various | base of new growth | after short rest | ditto | water sparingly during winter | Intermediate |

THE CULTURE OF ODONTOGLOSSUM CRISPUM AND ALLIED KINDS.

ODONTOGLOSSUM crispum is probably the most popular orchid in cultivation. No doubt it is a most lovely and serviceable species, yet I could never quite understand how an admirer and grower of orchids could cultivate this one species almost to the exclusion of all others, still such is the case in a few instances. Of course *O. crispum* is pretty, but it is absurd to say that it is prettier than hundreds of other species of orchids. It is also interesting, especially when one gets the mania for collecting the real cream of varieties, and the more or less spotted forms. But to the lover of the beautiful, I cannot possibly see how they can be more interesting than the majority of other orchids, or even so much so. Still the fact remains, *O. crispum* at the present day is a popular orchid, and I propose therefore to treat it rather fully in this edition, yet as briefly as possible.

Its cultivation is extremely easy when properly taken into hand, but otherwise it is apt to give a good deal of trouble. I advise all who would grow it to perfection to avoid too much of the kind of treatment that I will term "coddling," which will soon produce rootless drawn specimens that are unable to bear the strain of a strong spike of bloom.

Some Orchids will adapt themselves very well to artificial treatment, even though it may not be quite correct, and still do well, but this is not so with the present species, and this fact renders it a rather risky one for a new beginner to take in hand largely, before he has first mastered the most vital points in its cultivation. It is, however, often one of the first included in a newly formed collection, on the grounds that it is a cool growing species. I will now describe what I have found to be the most successful treatment, which on the whole will, I think, be found pretty correct, and I can conscientiously recommend its adoption by those who wish to succeed thoroughly well.

THE HOUSE.—I greatly prefer a low-built span-roof house, running north to south, either wide enough to admit of a centre step-like stage in addition to the side stages, or the latter only. Such a span-roofed house is not however absolutely necessary, for they may be grown in any other shaped house, and it may be in almost any position, from an aspect of due south to north, the management of course *varying accordingly*. Whatever the structure selected, the means of ventilation, both at top and bottom, must be ample, and the stages must be so arranged so as not to be too far away from the roof-glass. The furthest

point should not be more than four feet, and the nearest not less than one foot from the glass. I greatly prefer, and strongly advise, stages of an open nature, that is to say, a simple greenhouse stage formed of slats of wood, with a space of one or two inches left between each slat so that the air can circulate freely up between the plants. This question of open stages I consider of great importance, if really good results are to be obtained. The air plays a most vital part with these essentially air-loving plants, and the freest circulation which the outside conditions permit is at all times of the utmost importance. It has sometimes been thought that the principal point necessarily lay in the keeping of the house and the plants in a particular wet and humid condition, because of the rains and the exceptionally heavy dews of its native habitat. This explains the origin of closed stages—covered with some moisture retaining material and kept constantly saturated—on which the plants were stood. The idea however has proved to be wrong and misleading. I do not advise anyone who may be growing fairly good plants under such conditions to too suddenly change their methods of culture, or for that matter to change at all, still I am convinced that the idea of closed stages is wrong in principle for any orchid house. It is right of course, especially in summer to introduce large supplies of moisture which they in nature so much enjoy, but we must allow the air to play its counteracting part in our houses, just as it does in their native trees at home, and it is quite unable to accomplish this when the plants are placed on air-proof stages in pots. The air must freely circulate around and beneath them as well as above, in order to grow hardy, healthy plants.

SUMMER TREATMENT.—The treatment during the summer months is extremely simple and consists principally in shading well from the sun's rays, admitting large volumes of air, both night and day, whenever the outside conditions are at all seasonable, and keeping plenty of moisture distributed about the house and plants. But, fond of moisture as *O. crispum* undoubtedly is, the compost in which it is growing should not be kept continually in a state of saturation. I have proved beyond doubt that it does not pay to keep them so. When one comes to think, there seems something most unnatural about it. *O. crispum* is not found growing in bogs and marshes, but high up in the branches of trees, exposed to the full breezes, where it is morally certain they must sometimes get dry as well as wet, roots and all. That they like moisture and cannot get on for long without is well known, but I prefer to see my crispums get pretty dry at the roots before I again water them; the watering they receive in the meantime is over-head syringing with tepid water once or twice daily, according to requirements. This syringing is sufficiently heavy to thoroughly wet the foliage, and to moisten the surface of the compost, but not heavy enough to saturate the whole mass. The temperature of course should be kept as low as the weather will admit.

ORCHIDS WHICH MAY BE GROWN IN VINERIES OR PEACH HOUSES.

In an early chapter it was stated that I could not advise the culture of Orchids in fruit growing houses, and I intended these words to apply to Orchids generally, but when a vinery or peach house has been started in February or March, then the warmth such a house would afford would exactly suit the requirements of a few species of Orchids. By the time the fruit had ripened, and it became necessary to give the vines or fruit trees plenty of air in order to thoroughly ripen the wood, the new growth of the Orchids would be in an advanced condition and able to withstand, and indeed, would be benefited by large quantities of air and cool treatment, provided it be not too cold, remaining here until it became necessary to start the houses in the following year.

The following list indicates such Orchids as would be likely to succeed, and generally do well under such treatment, although I by no means assert that they are *sure* to do so, and it would be necessary to start with good plants and pay strict attention to cleanliness:—

| | |
|---|-----------------------------------|
| DENDROBIUMS (excepting those requiring more warmth during winter) | CYMBIDIUM EBURNEUM |
| LELIA ALBIDA | " LOWIANUM |
| " ANCEPS (IN VARIETY) | CYTOPODIUMS, ALL THE SPECIES |
| " AUTUMNALIS | CYPRIPEDIUM × AMANDUM |
| " MAJALIS | " ARGUS |
| SOBRALIAS, ALL THE SPECIES | " × ARTHURIANUM |
| THUNIAS, ALL THE SPECIES | " × ASHBURTONIE |
| VANDA SUAVIS | " BARBATUM |
| " TRICOLOR | " BOXALLII |
| " CŒRULEA | " × CROSSIANUM |
| " INSIGNIS | " × HARRISONIANUM |
| " KIMBALLIANA | " HIRSUTISSIMUM |
| BARKERIAS, ALL THE SPECIES. | " INSIGNE, AND ITS VARIETIES |
| CATASETUMS, ALL THE SPECIES | " × LATHAMIANUM |
| CATTLEYA MOSSIAE | " × LEEANUM |
| " GASKELLIANA | " × NITENS |
| " WARSCOWICZII (<i>syn.</i> GIGAS) | " × CENANTHUM |
| " HARRISONIANA | " PURPURATUM |
| " TRIANAE | " × SALLIERI |
| " LABIATA | " SPICERIANUM |
| CELOGYNE CRISTATA, AND ITS VARS. | " VENUSTUM |
| " MASSANGEANA | " VILLOSUM |
| " SANDERIANA | SELENIPEDIUM (CYPR.) × CARDINALIS |
| " CORRUGATA | " SCHLIMII |
| " OCELLATA | " × SEDEN |

ORCHIDS IN SMOKY TOWNS.

Although many kinds can be grown in town gardens there are some, the delicate flowers of which open in the winter and are not suitable for cultivation where a smoky, foggy atmosphere prevails, such for instance, as the genus *Phalænopsis*, and this is much to be regretted as the plants are often so much at home in town gardens, and are frequently met with in a flourishing state under such circumstances, but as they generally bloom in the winter the flowers are much too delicate to withstand dense fogs and the flowers therefore rarely open, the buds turning yellow and dropping off.

The spring-flowering *Dendrobiums* also give trouble in this respect, such species as *D. nobile* and the numerous hybrids produced from it, notably *D. × Ainsworthii*, *D. × Leechianum*, and such species as *D. Wardianum*, *D. crassinode*, and a few others, for heavy fogs are almost certain to destroy the flower buds of these varieties which flower early in the season if placed in too much warmth.

It is, therefore, better to retard their blooming by keeping them cool and not allow the flowers to expand until April, then the flowering state may be expected to be more satisfactory as the fogs then are fewer and less dense.

Some of the *Cattleyas* also give trouble, especially *C. Percivaliana*, and *C. Trianae*, both being early-blooming species, and invariably lose their flower buds under the influence of dense fogs.

There are several other kinds which also suffer, but not so severely as those already mentioned, such as *Lælia anceps* and other winter-flowering *Lælias*, the *Calanthes*, *Cattleya labiata*, and all of these suffer in a more or less degree, sometimes managing to unfold their sepals and petals but perhaps only for a short time.

Cypripediums and *Odontoglossums* are to be recommended as probably the best kinds of Orchids for the greenhouses of large towns, for although a large number of these flower in the winter, the flowers are better able to resist, without injury, the action of thick smoky fogs, but which would be fatal to the bloom of others. They are also most interesting and easily grown, many of the former having handsomely marked foliage, the flowers varying so much in form and colours, and a moderate-sized collection of them ensures an interesting display of flowers throughout the year.

RESULTS OF FURTHER EXPERIENCE OR THE AMATEUR'S ORCHID HOUSE.

HAVING since the publication of the Second Edition of this work resigned my position at Highbury, in order to start business as an Orchid Specialist, and at the same time undertaken to pay personal visits to demonstrate and tender advice on matters appertaining to the successful cultivation of Orchids, I am, in a sense, better qualified to pen these lines than was previously the case; for during the time I have been so engaged I have visited many collections, both large and small, and do not hesitate to say that in all cases I have learnt something—which knowledge I will impart to others. I have invariably—no matter in how poor a condition the collection generally may be in—seen one or more species in a particularly thriving state; the why and the wherefore I am always pretty careful to fathom. This fact having induced me to further experiment at home with my own plants I can conscientiously commit the following to paper, and will endeavour to do so, even more down to the level of the amateur, who I will assume knows little or nothing about orchid growing. It being the result of further experience, as above stated, the methods of cultivation hereafter recommended may appear at first sight to slightly contradict in some few instances advice previously tendered in this work. But after careful consideration I prefer to leave the last named entirely as first written, it being the embodiment of carefully thought out considerations in all details that are necessary to first bring success, whilst this will doubtless appear to readers to be a somewhat rash treatment to adopt, but it is one I can at the same time strongly recommend to their notice, asking that the one may be allowed to tone the other wherever any doubt may exist.

Now to commence with my subject, I am assuming that the would be cultivator has only one house which can conveniently be devoted to orchids the whole year round, and he wishes to have a number of easily grown kinds that will succeed with a general collection of plants. Here I beg to give amateurs and new beginners a word of advice, and to point out a mistake often made when they are commencing. They desire to grow Orchids, and think, and are perhaps sometimes told, that Cool Orchids may be grown in their greenhouse with a varied collection of half-hardy plants with no extra cost for increased warmth. But I must explain that the term *Cool Orchids* is an elastic one. There are so many so-called Cool Orchids, but the question is, can they be grown successfully in an ordinary greenhouse with an ordinary collection of half-hardy plants? The answer is, No! They may not die, they may even grow, but rarely do they increase in size, or make plants

satisfactorily. Their failure is not so much due to an insufficiency of heat, as to the aridity of the atmosphere—too much air at times, or too much sun. It should be borne in mind that Orchids, though fond of fresh pure air are also fond of moisture and shade to a reasonable extent. They also require a somewhat regular and evenly balanced temperature, and this is seldom found in an ordinary greenhouse. Better companions for Cool Orchids, if we consider the year throughout, are ferns and the warmer kinds of greenhouse plants, of which there are large numbers, not necessarily stove plants but sometimes classified as such.

The kinds that I would strongly recommend to amateurs are those commonly known as *Intermediate*, for such is the temperature that best suits the great majority. Most of those classified as *cool* and *hot* kinds grow equally as well *intermediate*, whilst but very few indeed require *strong heat*, or are *very cool* growing. There is therefore absolutely no reason whatever why the amateur with his one house should not grow an enormous number of species from various parts of the world with a great deal of success, and especially so if the structure has a small portion partitioned off, or if he possess a cool frame so as to provide better summer accommodation for *Odontoglossums* of the *crispum* section and just a few other cooler sorts.

Now to proceed with the subject of cultivation, and in order to make the same as clear as possible let us put the whole of those commonly called *intermediate*, as well as those already known as *cool* growing kinds, into one category and class the whole as *Cool Orchids*, sub-dividing them again into two classes or sections, which we will call the “warmer” and the “cooler” sections of cool growing Orchids. The first named will differ from the last mentioned only because they naturally prefer more warmth during the summer months when they are making their growth—in other words, the growing season in their native habitats is much warmer than their winter or resting season; whilst with the latter section there appears to be but little climatic difference between winter and summer, or the resting and growing seasons. This extra warmth preferred by the “warmer section” while making growth is very easy of attainment. Nature supplies it for us in the form of the sun. We can maintain during the summer any degree of warmth which we may wish. It is indeed easy by not paying due attention to little matters of ventilation and shading to have too much heat. To illustrate my meaning I will here state what I find to be the best treatment and most favourable conditions, which should prevail in the cultivation of those species which we constitute the *warmer* section of the *cool* Orchids; it will then be seen how very simple are their requirements. Generally during the summer there is but little difficulty in keeping the night temperature about 60° or 65°, which is ample. During the days it will range from these figures up

to 70° or 80°, perhaps more. No matter how careful one may be the temperature in hot weather may exceed 80° and frequently go to 90°. It cannot be helped and, although on paper it looks tremendous, it does no harm, for the simple reason that it is perfectly natural for the plants, viz. : Heat by day and cool refreshing nights. It does no harm providing that the ventilation and the moisture is present in sufficient quantities to prevent a stifling oppressive temperature. No doubt they get great sun heat on their native mountains, but it is of course accompanied with abundance of fresh air as well. To day the sun may be powerfully hot, to morrow it may be overcast and comparatively chilly, but this should not compel us to light the fire and heat the pipes so that the interior is as hot in the absence of the sun as with it. It is totally unnecessary, as well as harmful, to keep up a high temperature by fire alone. Supposing then we have a few dull days, as frequently we do, with no sunshine to raise the temperatures, we need not worry and force it up by making a large fire, but simply give less ventilation and employ less moisture and jog along quietly until the sun shines once more. It is perfectly natural for the temperature to vary day by day in their native habitat, therefore it may also do so in our houses. Of course during the spring time, and again during the autumn, we may get a particularly cold night or day, and perhaps a spell of a week or two, then, in order to prevent the temperature from becoming too cold, it is quite another thing, and enough heat in the pipes should be had to maintain the thermometer at about 60°, or a little more or less, and thus produce a healthy circulation of air—preventing it from becoming too cold and stagnant.

From the beginning of March until some time in October it is necessary to have some kind of shading for the purpose of protecting the plants from the sun. Few orchids can withstand the powerful rays of the sun falling direct upon them. If the house is a low built one, necessitating the stages to be pretty close to the roof glass, a permanent summer shading of whitewash may be used with a good deal of success, especially if an additional shading be at hand for use when the sun is particularly bright and persistent for a few hours during the days of the summer months. Should the house be high built, as some of the old fashioned structures sometimes are, the stages consequently being a good distance from the roof, then I should not recommend whitewash or anything permanently affixed, but a roller blind that can be rolled up during the afternoon when the influence of the sun's direct rays is no longer felt, and again let down in the morning when its influence becomes harmful. Some think that the shading should be removed if the clouds obscure the sun for a short time, and be again let down when it re-appears, but this is a great tie for the amateur who cannot always be present; it is also unnecessary, for orchids grow none the better for such fussy attention. During choppy treacherous weather it is better to let

the blinds remain down, and ventilate or not, just in accordance to the warmth of the weather.

A little care and thought is necessary when ventilating. It is safer for the amateur to use the bottom ventilators only to admit fresh air, employing the top ones only in warm weather when the atmosphere seems overheated and oppressive. By a too liberal application of top air the atmosphere, which should be kept pretty evenly charged with moisture, is apt to get very dry, hence a little care is required. Orchids when growing are extremely fond of moisture, not so much at the roots as atmospherically. They derive their food and nourishment from the air and the moisture it contains rather than from the saturation of the compost in which they are growing. They are often injured by keeping them too soddened at the root. It is not natural for them to have their roots confined to a mass of continually wet compost. It is much safer to under rather than to over water orchids at their roots, even at the height of their growing season. Especially is it so with plants in large pots. The compost must, however, be kept moist when growing by watering it occasionally.

As a method answering the double purpose of watering the roots almost sufficiently, as well as being all that is needful for damping down purposes, I will here recommend a system of judicious syringing overhead, and this is what this class of orchid delights in above anything else. I have a little lean-to house with a due south aspect where I continue this practice of syringing in lieu of damping and watering throughout the winter months with great success, doing it, not every day, but as often as seems necessary. But for general safety I must not here advise winter overhead damping or syringing, because in some kinds of structures its advantages might be outweighed by its disadvantages. We will start say about the middle of March. Once a day should be sufficient, doing it about nine or ten o'clock in the morning. If the outside conditions should be dull and cold it should then be left undone. This can go on to the month of May when it may with safety be done every morning between 7 and 8 o'clock, and a second time about 3 to 4 o'clock in the afternoon, when the air is reduced and the shading removed; do not however syringe the second time if the outside conditions are not genial. When we get well into June the second syringing can pretty safely be afforded every day, doing it as soon as the shading can be removed with safety, at the same time reducing the air so as to store up a good amount of sun heat to last the night. The bottom ventilators should not be closed unless the weather is very cold and ungenial. On the arrival of the latter end of September the morning syringing only is again sufficient, and by the end of October perhaps it had best cease altogether, falling back then to the daily damping of the stages, paths, &c., and watering those that are dry and need water with the watering can. Let the water used for syringing purposes be at

all times *rain* or *soft pond water*, with a sufficient amount of *clean hot water* added to make the whole lukewarm to the feel. The syringing should be tempered to a large extent by the prevailing weather. It may merely be a spray just enough to moisten the foliage and the surface of the compost, or it may be such that will make everything present the appearance of the outside garden after a drenching summer rain. Do not be afraid of anything. The water may lodge in the new growths, and on the most fragile blossoms, the former will not rot, nor will the latter damp or spot, providing the hot water pipes are warmed more or less when the nights or days, the nights especially, are unseasonably cold.

That pernicious species of Scale which attacks weakly specimens of *Cattleyas* or *Laelias* cannot breed and make much headway under this system of syringing, and by cleaning the plants with a small brush occasionally this scale quickly disappears. I particularly recommend amateurs who are away from home the greater part of the day to give this system of growing a trial, as I am convinced they will find it answer admirably, serving the two-fold purposes of sufficiently watering the plants without saturating the compost, and of producing a beautiful genial temperature suitable for the free, healthy, vigorous growth of the plants, with one tenth part of the claims upon their time, and they will soon discover that to be successful with the culture of orchids does not involve great expense nor time. As the summer advances and its end approaches, the new pseudobulbs will either be matured, or nearing that condition. As the autumn passes and the winter sets in the warmth of the summer sun will no longer be available, nor indeed will it be required. Overhead syringing should be discontinued. The plants will quite naturally finish up their pseudobulbs, and will then lapse into a state of rest, or partial inactivity. During the winter months they will want nothing more than to be kept free from excitement in any form whatever. Water should be given sparingly at the roots. The atmosphere should also be kept somewhat drier. In fact these plants will now demand nothing more than to occupy the same house, or to receive exactly the same conditions and treatment, as the others which I have previously called the "Cooler" sections of cool growing orchids. They all delight in similar treatment during winter and early spring. A temperature varying between 50° and 60° is the best. It may fall as low as 45° or at times even lower. It may likewise rise a little above 60°. But for the greater part of the time, the thermometer should range from 50° to 60°. A nice bright morning should be selected for giving a little water to prevent the roots and atmosphere from becoming too dry, which tends to exhaust the plants. It is surprising, however, what a small quantity is necessary for the purpose during the winter, unless excessive fire heat is used. During hard frosty weather more moisture distributed is needed than in damp

mild weather. Under these simple and easily obtainable conditions, which I have briefly attempted to describe, it is really remarkable what an enormous quantity of different species can be collected in one small house and there together grow, doing well and flowering freely. They are too numerous for me to here find space to mention them each separately. The quickest way for me will be to mention a few names of genera and species which would probably not succeed on account of insufficient heat. The whole of the others left unmentioned may be given a trial with reasonable chances of success. They may not *all grow well*, some are sure to do better than others, it is always so, even when that which supposed to be the most approved treatment is given by professional men. But what I say is, try a few inexpensive kinds to commence with.

Those kinds which I would advise an amateur to avoid for a time, unless it is with just one or two of each to experiment with, are as follows:—The species of *Bollea*, *Pescatorea*, *Phalænopsis*, *Angræcum*, and *Saccolabium*. Some few species of *Dendrobium* may also be mentioned, principally those coming from the East Indian Islands, such as *Dendrobium Phalænopsis*, and its var. *Schröderianum*, *D. superbum* (*macrophyllum*), *D. Lowi*, *D. Johnsoniæ* (*Macfarlanei*), *D. superbiens*, *D. bigibbum*, *D. atrovioleaceum* and *D. Dalhousieanum*; likewise a few *Cypripediums*, the principal of which are those coming from the hot lowlands of the East Indian Islands, such as *C. Rothschildianum*, *C. Lowii*, *C. Stonei*, *C. philippinensis* and *C. Sanderianum*. *Cattleya Eldorado*, *C. superba* and *C. Aclandiae* may also fail to do well on account of insufficient warmth. These are all I think that I need point out as being unlikely to grow with much certainty. Of course there are good many *Oncidiums*, *Odontoglossums*, *Masdevallias*, and some few others, independent from those mentioned in the following chapter, that delight in a pretty cold summer treatment. But still, if the house is not partitioned off, or the cool frame is not at hand, the whole, with the exception of those hereafter named, may be tried under the aforementioned conditions, where they will be found to grow very well if suitable positions are selected according to their requirements. The selections of which is the most interesting study of the whole thing, and one which can only be taught by practice, and the looking up of various works and writings on the subject, if necessary, after this work is exhausted.

Remember steam arising from the cold water coming in contact with the hot water pipes is most harmful to any orchid, and produces many ills. Of course it makes no difference on a small scale, such as a little accidentally. But why I mention this fact is because I find it is the custom of some amateurs to syringe the pipes whenever they are hot, to produce a vapour. Truly a moisture is thereby created, but it is certainly the wrong kind of moisture.

| NAMES OF PLANTS | Page | Whether to grow in Cool, Intermediate, or Warm House | Whether preferring a shady, sunny, or partial sunny position | Whether best grown in baskets or pans and suspended, or in pots on the stage | The most suitable compost | | | |
|------------------------------|------|--|--|--|--|---------|------------------------------|-------|
| CYPRIPEDIUM ROTHSCILDIANUM | .. | Warm | shady | pots | peat and sphagnum with a little fibrous loam | | | |
| — SANDERIANUM | .. | Inter- mediate | | | | | | |
| — SPICERIANUM | 104 | Warm | | | | | | |
| — STONEI .. | 148 | Inter- mediate | | | | | | |
| — SUPERBIENS .. | .. | Cool | | | | | | |
| — VENUSTUM .. | 189 | Inter- mediate | | | | | | |
| — VILLOSUM .. | 89 | Warm | | | | | | |
| — CARLONUM .. | .. | Inter- mediate | | | | | | |
| — CAUDATUM .. | .. | Warm | | | | | | |
| — LONGIFOLIUM .. | .. | Inter- mediate | | | | | | |
| — SCHLIMII .. | .. | Warm | sunny | { pots or baskets blocks | peat and sphagnum | | | |
| — ROEHLII .. | 120 | ditto | | | | | | |
| CYRTOPODIUM PUNCTATUM .. | .. | ditto | | | | | | |
| DENDROBIUM AGGREGATUM .. | .. | ditto | | | | partial | { baskets or pans pots | ditto |
| — X AINSWORTHII .. | 122 | | | | | | | |
| — AURUM (HETEROCARPUM) | 122 | | | | | | | |
| — BARBATUM .. | .. | | | | | | | |
| — BENSONLE .. | .. | | | | | | | |
| — BIGIBBUM .. | .. | | | | | | | |
| — BRYMERIANUM .. | .. | | | | | | | |
| — CAPILLIPES .. | .. | | | | | | | |
| — CHRYSANTHUM .. | 141 | | | | | | | |
| — CHRYSOTOXUM .. | .. | | | | | | | |
| — GRASSINODE .. | 140 | Intermediate | { blocks baskets or pans pots | | | | | |
| — CREPIDATUM .. | .. | | | | | | | |
| — CRYSTALLINUM .. | .. | | | | | | | |
| — DALHOUSIEANUM .. | .. | | | | | | | |
| — DEAREI .. | .. | | | | | | | |
| — DENSIFLORUM .. | 140 | | | | | | | |
| — DEVONIANUM .. | .. | | | | | | | |
| — X DOMINIANUM .. | .. | | | | | | | |
| — FALCONERI .. | 133 | | | | | | | |
| — FARMERI .. | .. | | | Warm | { baskets or pans | | | |
| — FIMBRIATUM .. | .. | | | | | | | |
| — FINDLAYANUM .. | 122 | | | | | | | |
| — FORMOSUM GIGANTEUM .. | 125 | | | | | | | |
| — INFUNDIBULUM .. | .. | | | | | | | |
| — JAMESIANUM .. | 86 | | | | | | | |
| — X LEECHIANUM .. | .. | | | | | | | |
| — LINAWIANUM .. | .. | | | | | | | |
| — LITUIFLORUM .. | .. | | | | | | | |
| — LUTEOLUM .. | 141 | Cool | { baskets or pans | | | | | |
| — MACCARTHEI .. | .. | | | | | | | |
| — MOSCHATUM .. | .. | | | | | | | |
| — NOBILE .. | 121 | | | | | | | |
| — PARISHII .. | .. | | | | | | | |
| — PHALLENOPSIS SCHREDERIANUM | 125 | | | | | | | |
| — PIERARDII .. | 141 | | | | | | | |
| — PRIMULINUM .. | .. | | | | | | | |
| — LODDIGESII .. | .. | | | | | | | |
| — SANGUINOLENTUM .. | .. | | | Warm | { baskets or pans | | | |
| — SUAVISSIMUM .. | .. | | | | | | | |
| — SUPERBIENS .. | .. | | | | | | | |
| — SUPERBUM .. | .. | | | | | | | |

| The best time to repot or top-dress | The usual time of blooming | From whence flower spikes appear, and whether on old or new growth | Whether showing spike directly growth is finished or otherwise | The proper resting period, if any | Amount of water at the roots when resting | Whether to winter or rest in Cool, Intermediate or Warm House |
|-------------------------------------|----------------------------|---|--|-----------------------------------|---|---|
| directly after flowering | spring | centre of last formed growth | when growth is finished | never inactive | water sparingly in winter | Warm |
| | summer | | | | | Intermediate |
| | winter | | | | | Warm |
| ditto | spring | from, and simultaneously with, new growth sides of previous year's pseudobulb | when starting to grow | winter | very little indeed | Intermediate |
| | summer | | | | | Warm |
| | winter | | | | | Cool |
| ditto | spring | on last made pseudobulb | after rest | ditto | very little | Intermediate |
| | summer | | | | | Warm |
| | winter | | | | | Intermediate |
| spring | spring | new pseudobulb | before rest | ditto | very little | Warm |
| | summer | | | | | Intermediate |
| | autumn | | | | | Warm |
| early spring | spring | previous year's pseudobulb | after rest | ditto | very little | Intermediate |
| | summer | | | | | Warm |
| | autumn | | | | | Intermediate |
| spring | spring | old pseudobulb | before rest | ditto | very little | Warm |
| | summer | | | | | Intermediate |
| | autumn | | | | | Warm |
| summer | spring | previous year's pseudobulb | after rest | ditto | very little | Intermediate |
| | summer | | | | | Warm |
| | autumn | | | | | Intermediate |
| spring | spring | new pseudobulb | after rest | never inactive | winter | Intermediate |
| | summer | | | | | Warm |
| | autumn | | | | | Intermediate |
| May | spring | previous year's pseudobulb | after rest | never inactive | winter | Intermediate |
| | summer | | | | | Warm |
| | autumn | | | | | Intermediate |
| spring | spring | last made pseudobulb | after rest | never inactive | winter | Intermediate |
| | summer | | | | | Warm |
| | autumn | | | | | Intermediate |
| about May | spring | new pseudobulb | after rest | never inactive | winter | Intermediate |
| | summer | | | | | Warm |
| | autumn | | | | | Intermediate |
| spring | spring | previous year's pseudobulb | after rest | never inactive | winter | Intermediate |
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| spring | spring | previous year's pseudobulb | after rest | never inactive | winter | Intermediate |
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| | autumn | | | | | Intermediate |
| spring | spring | new pseudobulb | after rest | never inactive | winter | Intermediate |
| | summer | | | | | Warm |
| | autumn | | | | | Intermediate |
| spring | spring | previous year's pseudobulb | | | | |

| NAMES OF PLANTS | Page | Whether to grow in Cool, Intermediate, or Warm House | Whether preferring a shady, sunny, or partial sunny position | Whether best grown in baskets or pans and suspended, or in pots on the stage | The most suitable compost |
|----------------------------------|------|--|--|--|---------------------------|
| DENDROBIUM THYRSIFLORUM | 105 | Warm | partial | pots or baskets | peat and sphagnum |
| — TORTILE | .. | | | pans or baskets | |
| — TRANSPARENTS | .. | | | pans or baskets | |
| — WARDIANUM | 126 | | | | |
| DISA GRANDIFLORA | 85 | Cool frame | shady | pots | peat, sphagnum and sand |
| EPIDENDRUM ATROPURPUREUM | .. | Interme- diate | sunny | pans or baskets | peat and sphagnum |
| — BICOENUTUM | .. | Warm | partial | | |
| — NEMORALE | .. | | sunny | | |
| — X O'BRIENIANUM | .. | Interme- diate | partial | pots | peat and sphagnum |
| — PRISMATOCARPUM | .. | | | pots or baskets | |
| — VITELLINUM | 85 | Cool | shady | pots | peat, loam and sphagnum |
| — WALLISII | 134 | Interme- diate | partial | pans or baskets | |
| EULOPHIA GUINEENSIS | .. | Warm | ditto | ditto | |
| GALEANDRA DEVONIANA | .. | Interme- diate | ditto | ditto | peat and sphagnum |
| — NIVALIS | .. | Warm | | ditto | |
| HABENARIA CARNEA | .. | ditto | ditto | ditto | peat, sphagnum and loam |
| — MILIARIS | .. | | ditto | ditto | |
| HOULLETIA BROCKLEHURSTIANA | .. | Interme- diate | ditto | ditto | peat and sphagnum |
| LELIA ALBIDA | 135 | ditto | sunny | baskets or pots | ditto |
| — ANCEPS | 108 | | | | |
| — AUTUMNALIS | 109 | | | | |
| — BOOTHIANA | .. | Cool Warm | partial sunny | pans or baskets | ditto |
| — CINNABARINA | 134 | | | | |
| — CRISPA | .. | | | | |
| — DAYANA | 123 | Interme- diate | partial sunny | pans or baskets | ditto |
| — DIGBYANA | .. | | | | |
| — X ELEGANS | 135 | | | | |
| — FLAVA | .. | Warm | sunny | pans or baskets | ditto |
| — FURFURACEA | .. | | | | |
| — GLAUCA | .. | | | | |
| — HARPOPHYLLA | 182 | Interme- diate | partial | pots or baskets | ditto |
| — MAJALIS | .. | | | pans or baskets | |
| — PERRINII | .. | | | pans or baskets | |
| — PURPURATA | 109 | ditto | ditto | pans or baskets | ditto |
| — SUPERBIENS | .. | | | pans or baskets | |
| — TENEBROSA | .. | | | pans or baskets | |
| — XANTHINA | .. | | | | |
| LEPTOTES BICOLOR | .. | ditto | ditto | pans, baskets or blocks | ditto |
| LYCASTE AROMATICA | 133 | ditto | ditto | pots or baskets | ditto |
| — CRUENTA | .. | | | | |
| — DEPPEI | 138 | | | | |
| — GIGANTEA | .. | | | | |
| — FLANA | .. | | | | |
| — SKINNERI | 110 | | | | |

| The best time to repot or top-dress | The usual time of blooming | From whence flower spikes appear, and whether on old or new growth | Whether showing spike directly growth is finished or otherwise | The proper resting period, if any | Amount of water at the roots when resting | Whether to winter or rest in Cool, Intermediate or Warm House |
|--|----------------------------|--|--|------------------------------------|---|---|
| spring | spring | previous year's pseudobulb | after rest | winter | very little | Intermediate |
| May | | | | | | |
| November or spring | May winter and spring | new pseudobulb | | | | |
| immediately after flowering | August | centre of new growth | on completion of growth | growing steadily throughout winter | water very moderately | Cool |
| spring | summer | | after short rest | winter | very little | Intermediate |
| summer | | | when growth is finished | never inactive | water moderately | |
| spring | winter | top of new growth | after short rest | winter | very little | Intermediate |
| after flowering | | | on completion of growth | never inactive | water moderately | |
| March or after flowering | summer | | after short rest | | | |
| spring | autumn | | after rest | winter | very little | Cool |
| ditto | ditto | base of new growth | on completion of growth | never inactive | water moderately | Intermediate |
| ditto | ditto | | before rest | winter | very little | Warm |
| ditto | ditto | top of new pseudobulb | ditto | ditto | ditto | Intermediate |
| ditto | ditto | centre of new growth | ditto | ditto | ditto | ditto |
| after flowering | spring | base of new pseudobulb | after rest | ditto | ditto | Intermediate |
| spring | winter | | | | | |
| spring or August spring | summer | | before rest | ditto | ditto | ditto |
| after flowering | spring | | | | | |
| | summer | | after rest | never inactive | water moderately | Warm |
| | autumn | | before rest | | | |
| | spring or autumn | top of new bulb | before rest | | very little | Intermediate |
| | spring | | after rest | | | Warm |
| spring | spring | | after rest | winter | water carefully | |
| | summer | | | | very little | Intermediate |
| after flowering | autumn | | | | | |
| spring | summer | | before rest | never inactive | water carefully | |
| after flowering | winter | | | | | |
| after flowering | summer | | | | | |
| ditto | spring | ditto | after rest | winter | very little | ditto |
| directly new growth commences or after flowering | summer | base of new bulb | simultaneously with new growth | ditto | ditto | ditto |
| after flowering | early spring | | | | | |
| | spring | | | | | |

| NAMES OF PLANTS | Page | Whether to grow in Cool, Intermediate, or Warm House | Whether preferring a shady, sunny, or partial sunny position | Whether best grown in baskets or pans and suspended, or in pots on the stage | The most suitable compost |
|---------------------------------------|------|--|--|--|---------------------------|
| MASDEVALLIA AMABILIS | 131 | Cool | shady | pans or pots | peat and sphagnum |
| — X CHELSONI | 131 | Interme- diate | | baskets | |
| — CHIMERA | 84 | Cool | | pans or baskets | |
| — SHUTTLEWORTHII | 84 | Cool | | pots | |
| — HARRYANA | 84 | Cool | | pans | |
| — DAVISII | 84 | Cool | | or pots | |
| — HOUTTEANA | 84 | Cool | | pans or baskets | |
| — IGNEA | 84 | Cool | | pans | |
| — POLYSTICTA | 84 | Cool | | or pots | |
| — RICHENBACHIANA | 84 | Cool | | pans or baskets | |
| — ROSEA | 136 | Interme- diate | ditto | pans | ditto |
| — SCHLIMII | 84 | Interme- diate | | or pots | |
| — TOVARENSIS | 84 | Interme- diate | | pots | |
| — VEITCHIANA | 84 | Interme- diate | | pans or baskets | |
| — WAGENERIANA | 85 | Cool | | pots | |
| MAXILLARIA GRANDIFLORA | 85 | Cool | | pots | |
| — SANDERIANA | 132 | Interme- diate | | pots or baskets | |
| — VENUSTA | 132 | Cool | | pots or baskets | |
| MILTONIA CLOWESII | 140 | Interme- diate | ditto | pans, baskets, or pots | ditto |
| — PHALÆNOPSIS | 110 | Warm | | pans, baskets, or pots | |
| — ROZLII | 110 | Interme- diate | | pans, baskets, or pots | |
| — SPECTABILIS | 110 | Warm | | pans, baskets, or pots | |
| — VEXILLARIA | 142 | ditto | | pans or baskets | |
| — WARSCEWICZII | 142 | ditto | | pans or baskets | |
| MORMODES LUXATUM | 129 | Cool | | pots | |
| — KBUENEUM | 130 | Interme- diate | | pans | |
| — PARDINUM | 79 | Interme- diate | | pots | |
| — CITROSUM | 104 | Interme- diate | | baskets | |
| ODONTOGLOSSUM X ANDERSONIANUM | 130 | Cool | shady | baskets | ditto |
| — BICTONIENSE | 76 | Cool | | baskets | |
| — BLANDUM | 129 | Interme- diate | | pots | |
| — CERVANTESII | 129 | Interme- diate | | pots | |
| — CIRRHOSUM | 129 | Interme- diate | | pots | |
| — CITROSUM | 129 | Interme- diate | | pots | |
| — X CORADINEI | 129 | Interme- diate | | pots | |
| — COORDATUM | 129 | Interme- diate | | pots | |
| — CORONARIUM | 129 | Interme- diate | | pots | |
| — CRISPUM | 129 | Interme- diate | | pots | |
| — EDWARDII | 129 | Interme- diate | shady | pots | ditto |
| — GRANDE | 129 | Interme- diate | | pots | |
| — HALLII | 129 | Cool | | pots | |
| — HARRYANUM | 129 | Interme- diate | | pots | |
| — HASTILABIUM | 129 | Interme- diate | | pots | |
| — INSLEAYI LEOPARDINUM | 129 | Interme- diate | | pots | |
| — SPLENDENS | 129 | Interme- diate | | pots | |
| — LINDLEYANUM | 129 | Interme- diate | | pots | |
| — LUTEO-PURPUREUM | 129 | Interme- diate | | pots | |
| — MACULATUM | 129 | Interme- diate | | pots | |
| — NEBULOSUM | 130 | Cool | shady | pots | ditto |
| — ODORATUM | 130 | Cool | | pots | |
| — PISCATOREI | 130 | Cool | | pots | |
| — POLYXANTHUM | 130 | Cool | | pots | |
| — PULCHELLUM | 130 | Cool | | pots | |
| — RAMOSISSIMUM | 130 | Cool | | pots | |
| — ROSSII MAJUS | 130 | Cool | | pots | |
| — ROSSII MAJUS | 130 | Cool | | pots | |
| — ROSSII MAJUS | 130 | Cool | | pots | |
| — ROSSII MAJUS | 130 | Cool | | pots | |

| The best time to repot or top-dress | The usual time of blooming | From whence flower spikes appear, and whether on old or new growth | Whether showing spike directly growth is finished or otherwise | The proper resting period, if any | Amount of water at the roots when resting | Whether to winter or rest in Cool, Intermediate or Warm House |
|--|--|--|--|--|--|---|
| February, or after flowering | spring and summer | base of last made leaves | simultaneously with new growth | never inactive | water carefully in winter | Warm end of Cool or Intermediate |
| spring after flowering | winter and spring spring and summer autumn and winter summer | base of new pseudobulb | ditto | ditto | ditto | Intermediate |
| spring | autumn and winter | | | | | |
| ditto | autumn | | | | | ditto |
| after flowering | late winter various summer spring | base of last made pseudobulb | ditto | ditto | water sparingly during winter | Warm Intermediate Warm |
| spring | summer | base of newly forming pseudobulb | before rest | winter | very little | Intermediate |
| | spring autumn spring winter spring summer various | base of last made pseudobulb | ditto | never inactive winter never inactive | water sparingly in winter | Cool |
| | spring | centre of new growth base of last made pseudobulb | | winter never inactive | very dry water sparingly | Intermediate |
| | various early spring early autumn winter and spring early autumn summer late autumn various winter and spring spring summer spring various spring | base of previous year's pseudobulb | after rest | autumn never inactive winter | very dry water sparingly very little | Cool |
| when growth is starting from March until September | various early spring early autumn winter and spring early autumn summer late autumn various winter and spring spring summer spring various spring early spring spring | base of last made pseudobulb | | never inactive | water sparingly | Intermediate Cool |
| | late autumn various winter and spring spring summer spring various spring | side of new growth base of new pseudobulb | before rest | winter never inactive autumn never inactive | very little water sparingly in winter | Intermediate Cool |
| | early spring spring | side of new growth base of new pseudobulb | | | | |

| NAMES OF PLANTS | Page | Whether to grow in Cool, Intermediate, or Warm House | Whether preferring a shady, sunny, or partial sunny position | Whether best grown in baskets or pans or suspended, or in pots on the stage | The most suitable compost |
|---|------|--|--|---|---------------------------|
| ODONTOGLOSSUM X RUCKERIANUM | .. | Cool | shady | pots | peat and sphagnum |
| — TRIUPDIANS | .. | | | | |
| — TRIUMPHANS | 79 | | | | |
| — URO-SKINNERI | .. | Warm | partial | baskets or pots | |
| ONCIDIUM AMPLIATUM | .. | | | | |
| — CAVENDISHIANUM | 141 | Cool | shady | baskets or pans | |
| — CHRISOPHORUM | .. | | | | |
| — CONCOLOR | .. | | | | |
| — CRISPUM | .. | Warm | shady | pots | |
| — GUCULLATUM | .. | | | | |
| — CURTUM | .. | Cool | shady | baskets or pans | |
| — FLXUOSUM | 142 | | | | |
| — FORBESII | 131 | Intermediate | shady | baskets or pots | |
| — HASTATUM | .. | | | | |
| — JONESIANUM | .. | Warm | sunny | blocks or pots | |
| — KRANERIANUM | 141 | | | | |
| — LANCEANUM | .. | Cool | shady | baskets or pots | ditto |
| — LURIDUM | .. | | | | |
| — MACRANTHUM | 80 | Intermediate | shady | baskets or pots | |
| — MARSHALLIANUM | 130 | | | | |
| — ORNITHORHYNCHUM | 131 | Warm | shady | baskets or pots | |
| — PAPILIO | 127 | | | | |
| — SARCODES | .. | Intermediate | partial | pots | |
| — SPEACKLATUM | .. | | | | |
| — SPLENDIDUM | .. | Cool | shady | baskets or pans | |
| — TIGRINUM | 80 | | | | |
| — VARIOSUM | 83 | Warm | ditto | ditto | ditto |
| PAPHINIA CRISTATA | .. | | | | |
| — GRANDIFLORA | .. | ditto | partial | pots | { peat, sphagnum and loam |
| PERISTERIA ELATA | 142 | | | | |
| PESCATOREAS | .. | ditto | shady | { baskets or pots | sphagnum |
| PHAIUS GRANDIFOLIUS | 127 | | | | |
| — TUBERULOSUS | .. | ditto | ditto | { baskets or pots | { peat, sphagnum and loam |
| — WALLICHII | .. | | | | |
| PHALÆNOPSIS AMABILIS (syn. GRANDIFLORA) | .. | ditto | ditto | baskets | sphagnum |
| — APHRODITE | .. | | | | |
| — LURIDEMANNIANA | .. | Intermediate | partial | pots or baskets | peat and sphagnum |
| — SANDERIANA | 126 | | | | |
| — SCHILLERIANA | .. | Warm | ditto | ditto | ditto |
| — SPECIOSA | .. | | | | |
| — STUARTIANA | .. | ditto | ditto | ditto | ditto |
| — VIOLAŒA | .. | | | | |
| PILUMNA FRAGRANS | 137 | Warm | ditto | ditto | ditto |
| PLATYCLINIS CORBIANA | .. | | | | |
| — FILIFORMIS | .. | ditto | ditto | ditto | ditto |
| — GLUMACEA | .. | | | | |

| The best time to repot or top-dress | The usual time of blooming | From whence flower spikes appear, and whether on old or new growth | Whether showing spike directly growth is finished or otherwise | The proper resting period, if any | Amount of water at the roots when resting | Whether to winter or rest in Cool, Intermediate or Warm House |
|---|---|--|--|-----------------------------------|---|---|
| when growth is starting, from March until September | { winter and spring early spring autumn summer | { base of new pseudobulb | before rest | never inactive | Water sparingly in winter | Cool |
| { spring | { winter autumn and winter late spring summer | { | | | | { Warm Interme- diate |
| { summer autumn | { summer | { base of new bulb | | | | { Cool |
| { spring | { autumn | | | | | { Warm Cool |
| { summer | { summer | | | | | { Interme- diate |
| { spring | { various | | spikes are produced shortly after pseudobulb is completed | a short rest whenever inactive | if growing, or otherwise, water sparingly during winter | { Warm |
| { summer | { summer | { from new growth | | | | { Cool |
| { spring or autumn | { winter various | | | | | { Interme- diate |
| | { spring | { base of new bulb | | | | { Warm |
| { spring | { autumn | | | | | { Interme- diate Warm |
| | | | | | | { Cool |
| ditto | ditto spring | ditto | ditto | ditto | ditto | Warm |
| ditto | summer | ditto | after rest | winter | very little | ditto |
| after flowering | ditto | base of last made growth | when growth is completed | never inactive | { water carefully in winter | ditto |
| early spring | { early spring | { base of new bulb | soon after bulb is completed | a short rest whenever inactive | water sparingly | ditto |
| spring | { spring | | | | | |
| summer | { autumn and winter spring autumn winter spring winter summer | { axil of leaves | when last leaf has formed | a short rest after flowering | ditto | ditto |
| spring | | | | | | |
| ditto | spring | ditto | after rest | winter | ditto | Interme- diate |
| ditto | summer | centre of new growth | ditto | ditto | ditto | ditto |

| NAMES OF PLANTS | Page | Whether to grow in Cool, Intermediate, or Warm House | Whether preferring a shady, sunny, or partial sunny position | Whether best grown in baskets or pans and suspended, or in pots on the stage | The most suitable compost |
|---------------------------------|------|--|--|--|---------------------------|
| PLEIONE HUMILIS | .. | Cool | partial | | |
| — LAGENARIA | 131 | Cool or Intermediate | sunny | pans or baskets | peat, sphagnum and loam |
| — MACULATA | 132 | | | | |
| — WALLICHIANA | .. | | | | |
| — REICHERTBACHIANA | .. | | | | |
| RESTREPIA ANTENNIFERA | .. | with Masdevallias | shady | ditto | peat and moss |
| — ELEGANS | .. | | | | |
| SACCOLABIUM AMPULLACEUM | .. | Warm | ditto | baskets | sphagnum moss |
| — BELLINUM | .. | | | baskets or pots | |
| — BLUMEI | 139 | | | baskets | |
| — CURVIFOLIUM | .. | | | baskets or pots | |
| — GIGANTEUM | .. | | | baskets | |
| — VIOLACEUM | .. | | | baskets | |
| SCHOMBURGKIA SUPERBIENS | .. | Intermediate | sunny | pots | peat and sphagnum |
| — TIBICINIS | .. | | | baskets | |
| SOBRALIA LILIASTRUM | .. | ditto | partial | pots | loam and peat |
| — MACRANTHA | 111 | | | | |
| — XANTHOLEUCA | 138 | | | | |
| NOPHRONITIS GRANDIFLORA | 83 | Cool Intermediate | shady | baskets or pans | peat and sphagnum |
| — VIOLACEA | .. | | | | |
| SPATHOGLOTTIS AURMA | .. | Warm | partial | baskets or pots | peat, sphagnum and loam |
| — FORTUNEI | .. | | | | |
| — VIEILLARDI | .. | | | | |
| STANHOPEA EBURNEA | .. | ditto | ditto | baskets | peat and sphagnum |
| — INSIGNIS | 142 | | | | |
| — OCULATA | 142 | | | | |
| — TIGRINA | 128 | | | | |
| STENIAS | .. | ditto | shady | baskets or pots | sphagnum |
| THUNIA ALBA | .. | Intermediate | sunny | pots | peat, sphagnum and loam |
| — BENSONIE | .. | | | | |
| — MARSHALLIANA | 112 | ditto | partial | pots or baskets | peat and sphagnum |
| TRICHOPILOIA CRISPA | .. | | | | |
| — MARGINATA | .. | ditto | ditto | ditto | ditto |
| — SUAVIS | 137 | | | | |
| — TORTILIS | .. | | | | |
| TRICHOSMA SUAVIS | .. | ditto | ditto | ditto | ditto |
| VANDA AMESIANA | .. | rather warmer than Intermediate | ditto | ditto | sphagnum moss |
| — CERRULEA | 137 | | | | |
| — CERRULESCENS | .. | Intermediate | ditto | pots | sphagnum moss |
| — INSIGNIS | .. | | | | |
| — KIMBALLIANA | 84 | Cool | sunny | baskets or pots | peat and loam |
| — SANDERIANA | .. | | | | |
| — SUAVIS | 137 | Intermediate | shady | baskets or pots | ditto |
| — TERES | .. | | | | |
| WARSCWICZELLAS | .. | ditto | shady | baskets or pots | ditto |
| ZYGOPETALUM × CLAYI | .. | Intermediate | partial | pots | peat and loam |
| — CRINITUM | .. | | | rafts or baskets | peat and sphagnum |
| — MACKAYI | 113 | | | | |
| — MAXILLARE | .. | | | | |

| The best time to repot or top-dress | The usual time of blooming | From whence flower spikes appear, and whether on old or new growth | Whether showing spike directly growth is finished or otherwise | The proper resting period, if any | Amount of water at the roots when resting | Whether to winter or rest in Cool, Intermediate or Warm House |
|--|--|--|--|-----------------------------------|---|---|
| directly after flowering | winter autumn | centre of new growth | after rest | never inactive | water sparingly during winter | Cool Intermediate |
| spring | summer | top of new and old pseudobulb | ditto | ditto | ditto | Intermediate, or with Masdevallias |
| early spring | ditto spring summer | from stem or axil of the 3rd or 4th leaf from the top | ditto | never entirely inactive | ditto | Warm |
| spring | winter autumn and winter early summer | top of new pseudobulb | before rest after short rest | winter | very little | warm Intermediate |
| after flowering | summer | top of new stems | ditto | never inactive | water sparingly during winter | Intermediate |
| spring | winter | top of new pseudobulb | before rest | short time after flowering | ditto | warm end of Cool house |
| when starting to grow, usually in spring | usually during the summer | base of last made pseudobulb | when growing again | winter | ditto | Warm |
| early spring | usually during the late summer months | ditto | ditto | ditto | very little | ditto |
| after flowering | summer | base of last made growth | when growth is completed | never inactive | water carefully in winter | ditto |
| early spring | ditto | top of new pseudobulb | before rest | winter | very little indeed | Intermediate |
| after flowering | late spring spring | base of last made pseudobulb | after rest | ditto | very little | ditto |
| spring | late spring early spring | top of last made pseudobulb | after short rest | ditto | ditto | ditto |
| ditto | spring autumn spring | from stem or axil of the 3rd or 4th leaf from top | ditto | winter, requires but little rest | water sparingly during winter | rather warmer than Intermediate |
| after flowering | late spring late summer spring summer | base of last made growth | when growth is completed | winter never inactive | very little water carefully in winter | Warm ditto |
| early spring | various winter various | base of new growth | after short rest | ditto | water sparingly during winter | Intermediate |

QUESTIONS AND ANSWERS.

R. L., SOUTH WALES, asks :—What is the proper treatment of *Odontoglossum crispum*? I have been told that, like many other Cool Orchids, it requires only a cool frame to grow in and does well when planted out, but under cold frame treatment the leaves of my plants are turning yellow and the plants appear to be dying.

REPLY.—The attempt to grow Orchids in a cold frame or pit invariably ends in wretched failure, and could only be done with any chance of success by someone who thoroughly understands the treatment they require. For a few months during the summer *Odontoglossums* will do fairly well in a frame facing the north if they are in pots and placed on a stage or inverted flower pots. The planting-out system is a wrong one, and when done the plants should be taken up in March or April and place them in rather small pots, when they get established quicker than in large ones.

D. A. asks :—I should much like to know the proper time of the year when *Lælia purpurata* should be repotted, and what is the best compost to grow it in? Also the best way to make established plants of newly imported *Odontoglossum crispum*.

REPLY.—*Lælia purpurata* should be repotted any time immediately after it has done flowering, which is about the beginning of June, and then it will again start into growth. The plants always shrivel more or less after repotting, according to its state of health, but soon recover. Repot the plants about once in two or three years, the pots well drained to half their depth, using clean crocks, larger ones at the bottom with smaller at the top. Then pot in fibrous peat and sphagnum moss in equal proportions.

The best way to establish newly imported *Odontoglossum crispum* is at first to treat them very carefully, otherwise many may not recover from their long journey, being generally in a very shrivelled condition. Directly the plants are received all dead leaves and old useless matter should be cut away and decayed roots trimmed, the plants then placed upon a layer of damp sphagnum moss placed on the stage of a cool house, placing them one against the other in an upright position. The moss must be kept moist, avoiding watering the plants overhead until reaction has set in. When the bulbs have plumped up and new roots begin to push out from the base, then pot the plants in the usual compost of peat and sphagnum, in rather small pots, and then treat as established plants. The plan of placing newly imported Orchids in dark places under the stage, or suspending them head downwards, as is sometimes done, cannot be too strongly condemned. The plants, however, should be protected from strong light for the first few days until they are more accustomed to it.

A. B., NORTH DEVON, writes :—I should very much like to see in print a reply dealing fully with the hygrometer; for instance, should it not always

register *over* saturation point in the *Odontoglossum* house? In such a house with a north aspect it is a simple matter (at least in winter) to remain at saturation point, and that does not seem to me to be moisture enough in the air for this class of plants, as they dry so quickly, owing I suppose to the amount of ventilation they get. Then the *Cattleya* house seems to me to do better when never quite reaching saturation point. Here we live on the top of a hill, and the air is very pure and the sunlight strong. The *Cattleya* house to-day (January 8th) has reached 90° of sun heat, and it is impossible to ventilate too freely as there is a cold north wind; of course the hygrometer under such conditions registered about 8° or 9° of dry heat. It would be a great help if you could let me know what is best to be done under such circumstances. I do not like to shade yet, as I imagine sun heat is so very beneficial just now to the *Dendrobes*, which are resting in the *Cattleya* house. The East India house, where I keep most of the *Cypripediums*, never ranges more than 3° from saturation point, and being next to the *Odontoglossum* house it does not get so much sun as the *Cattleya* house. I have used leaves on the lower stage as you recommend, and I have a long narrow tank containing four inch pipes and is kept full of water to counteract the effects of the large hot water pipes above, so that I have moisture above and below the hot water pipes, also a huge tank along the centre of each house below the centre stage; still I find it hard work in bright weather to keep the *Cattleya* house at all moist. If you could state the variations near about what the hygrometer should register for the different months, it would be a great help to many.

REPLY.—The hygrometer is an instrument, the want of which in the cultivation of plants is so little felt amongst gardeners that very few possess them, and with that few the hygrometer may often be seen doing duty as a thermometer only, the wet bulb not being kept supplied with moisture. It is difficult to get the atmosphere beyond saturation point, and it is not advisable to try to do so. In the *Odontoglossum* house saturation point should be generally attained, or the nearer to it the better during the spring, summer, and autumn months. It is not possible to maintain it if the house is properly ventilated, and the hygrometer will stand about 3° below saturation point. In the winter it is easy to keep the cool house at saturation, but it is better if it remains for the greater part of the time at 1° or 2° below. In the other houses damp down freely, but the hygrometer will never stop at saturation long, nor is it advisable. Air is an important factor as well as moisture, and when air is admitted properly the wet bulb will stand at from 3° to 5° below the dry one; if lower, then there is not enough moisture in the house. In these houses during the winter I always damp down when the hygrometer shows 3° to 5° of evaporation, unless for a short time at mid-day. If the directions given in the Calendar of Operations for each month are acted upon, the hygrometer should register these figures. Water tanks are invaluable for the storage of rain water, but practically a body of water is useless for producing moisture unless made, by the aid of hot water pipes running through it, warmer than the temperature of the house. ^AThen moisture is produced in the form of steam, but this is a method I do not recommend, for if not managed very carefully too much steam is generated, which is very injurious. The best way to cause evaporation is to frequently syringe the paths, stages, and wall.

A. G., LIVERPOOL, asks:—What is the proper treatment of *Oncidium Lanceanum*? Mine are in the Warm house, but fail to grow satisfactorily, and the leaves are covered with black spots as in foliage I enclose.

REPLY.—This species seems peculiarly liable to this kind of spot, and greatly disfigures the handsome foliage. It is one of those Orchids which grow freely when placed in the right position. This spot is no doubt caused by a superabundance of moisture. It is a Hot-house Orchid, but should not be grown in that house regardless of position. It should be remembered that it belongs to the stout-leaved section, and on that account can endure a good deal of dryness in the atmosphere. A position which is dry and exposed to the light should be selected for it during winter, taking care not to over-water it. In summer it succeeds well if suspended with the Warm-house *Dendrobiums*.

A CORRESPONDENT, G. W. B., KENT, asks six questions, as follows, with my reply to each:—

1.—What are the general conditions of growth of an Orchid that should decide the cultivator whether a species should by preference be *basketed* or *potted*, besides the fact of its liking to be near the glass, or not?

REPLY.—Orchids which really do best in pots or pans are those whose roots will not grow if exposed, unless the air is charged with an excess of moisture. The roots of *Cypripediums*, *Odontoglossums*, and similar kinds, generally make but little progress until they get beneath the compost, and when once there they show no inclination to reappear on the surface. On the other hand, Orchids whose roots show no special preference to hide themselves, and grow rapidly until coming into contact with some object upon which they speedily take a firm hold, are best with basket culture. Amongst the latter may be named *Cattleyas*, *Lælias*, *Phalænopsis*, *Aërides*, &c., but there are exceptions to every rule. Such tall growing kinds as some of the *Aërides*, *Vandas*, *Saccolabiums*, and *Angræcums*; some of the *Lælias* also, such as *purpurata*, and varieties of *elegans*, *harpophylla*, *cinnabarina*; also the tall growing *Cattleyas*, such as the *guttata* varieties, and *Harrisonia*, *intermedia*, and some of the *labiata* varieties, which are tall and heavy. Then there are also many tall growing *Dendrobiums* and others which could be mentioned, all belonging to the section of aerial rooting Orchids, which require to be placed on the stage owing to their great height. Pots are more convenient and answer the purpose better than baskets, for they are cheaper and answer equally well. Then any aerial roots which may penetrate the compost are more secure from the ravages of the various pests to be found amongst the plants. There are many Orchids which are suspended in baskets or shallow pans, simply because they are dwarf growing, and are thus brought nearer the light, such for instance as the small growing *Masdevallias*, *Oncidiums*, and *Odontoglossums*, the *Pleiones*, *Sophranitis grandiflora*, &c.

2.—In repotting plants that have not appreciably increased in size, is it preferable to clean away the old material and pot up in the *same size* pot with fresh stuff, or to allow the old ball to remain and increase the size of pot?

REPLY.—In repotting Orchids never allow the old ball to remain intact. Only one thing can possibly be worse, and that is allowing the old pot to be placed into a larger one and covered with new compost. I have seen this

method adopted, and by those who ought to have known better. It is preferable to clear away the whole of the old material of the old ball, gently separating it from the roots, so that in repotting the *whole* of the compost is fresh and sound. I do not wish it to be understood that it is absolutely necessary that every particle of the old material should be cleaned away at the risk of breaking or bruising or otherwise destroying the roots. Such a practice is to be deprecated. Unless a plant has increased in size it is frequently advisable to repot into the same sized pot in new compost. Should there have been a decrease in size then a smaller pot may be used.

3.—Should Orchids that are making new growth in the winter months be encouraged to do so *freely*, by keeping warmer or moister, or should the growth be allowed to proceed but *slowly*?

REPLY.—Should an Orchid which naturally starts its growth in spring and completes it during the summer and autumn (such for instance as a Dendrobium or a Cattleya), from some cause or other be found struggling to do in the winter what should have been accomplished in the summer, then a little more help and encouragement should be given to it, and the plant should receive assistance. On the other hand, there are many Orchids which are naturally making new growth throughout the winter; such as *Lælia purpurata*, *Odontoglossums*, *Oncidiums*, and others. Such should be allowed to proceed slowly in the departments recommended for them, assisting the plant to mature its growth in a sound, healthy condition, rather than risk losing it by unduly exciting it into growth.

4.—When new growth and flowers are being developed at the *same time*, as for example in *Dendrobium nobile*, *D. Wardenianum*, *Odontoglossum citrosimum*, is it better to repot or basket before the flowers are out, or after they are over?

REPLY.—In most cases it is best not to disturb the roots by repotting until after the plant has flowered, although with some species whether repotting takes place before or after flowering is not so important. I, on one occasion, potted up some *Cattleya Mossiae* just before flowering, and they grew equally as well as others potted afterwards. Still it is best, with the exception of such Orchids as *Anguloas* and *Lycaste aromatica*, to pot directly after flowering. The two Orchids just named grow so fast, that before the flowers have faded the new growth and young tender roots have made such headway that if disturbed then, they receive a great check. *Dendrobium Wardenianum* is the only Dendrobe I know that may be potted before blooming. I have repotted these in December before the flower buds were too large, but never allowing that operation to interfere with their course of resting, as it is not necessary to place them in more warmth immediately afterwards. I also repot after flowering.

5.—Is there any remedy for preventing the entire decay of a *Cattleya* bulb when once attacked with mildew, arising from moisture and dampness in the sheath after blooming; and what treatment is advisable, besides proper ventilation and careful watering, to ensure the bulb from such attack altogether?

REPLY.—Yes, by the complete removal of the decaying part, cutting it cleanly away from the top of the bulb as far as the disease has extended downwards, and afterwards scraping the wound with a knife to remove a little of the moisture. The treatment advisable as a preventive is to remove bodily

the old flower stem and sheath immediately after blooming and slightly powder the wound with charcoal. This together with the air soon dries up the wound, and decay does not again appear unless the culture of the plant is greatly at fault. It is the autumn blooming species of the *Cattleya* which more strictly require this attention.

6.—What is the probable cause of *Calanthe vestita oculata* failing to throw flower spikes (after full sized bulbs have been formed), whilst *C. Veitchii* is blooming freely? The *Vestita oculata* were grown singly in 60-sized pots; the *Veitchii* in large pots with 3 or 4 plants in each—in other respects the treatment of both species was apparently the same.

REPLY.—I cannot understand the cause of this, and it is difficult to assign a reason why your *Calanthe vestita oculata* failed to flower after making full sized bulbs as it is generally so very free blooming. The flower spikes may have been injured and destroyed unobserved when very young; or that the plant may have received a violent check which stopped all further growth. A large 60-sized pot is very small for a full-sized bulb of *Calanthe vestita*, and I advise the use of a 48-size.

W. T. O., SCOTLAND, writes:—I think if you gave a little more information as to ventilation, especially as regards *night* ventilation, it would be useful. Also, I have this year had great trouble with the *Cattleya* fly. I never had it before and imagine it was introduced with some imported plants of *C. labiata* vera. A little more information on that *beast* would be welcomed. *Odontoglossum grande* and *Miltonia vexillaria* I cannot manage at all. I have only one house to spare for Orchids, an Intermediate house, but these two Orchids will not thrive although I manage *Cattleyas* all right.

REPLY.—Your first question will, I think, be answered under the heading of "Ventilation" by additional information given. The *Cattleya* fly is indeed a terrible pest. Should your plants be newly imported, look well into them and search for crippled growths or imperfect pseudobulbs, and examine them closely to see if the fly has been the cause of the mischief. If so, a hole will be somewhere near the base of the crippled growth from which the fly escaped on reaching maturity. If no hole can be seen, and yet still a suspicion that the fly has been there, then give the suspected growth a wrench and it will invariably break owing to its being hollowed out by the grub. It does not follow that the live larvæ is sure still to be in the plant, but it is probably so, and should be closely watched for. Too much caution cannot be exercised in buying *established* plants, for it has been in connection with the purchase of such plants that I once had a very narrow escape from a serious attack of the *Cattleya* fly, and I am afraid that plants are sometimes sent to sales when found to be affected by this insect, without any thought on the part of the sender as to the great risk to the buyer. I am not quite sure whether this pest is not sometimes bred upon ill cared for plants, not spontaneously.

Your Intermediate house should grow *Odontoglossum grande* and *Miltonia vexillaria* quite well, but, perhaps, your plants have got into bad condition, if so, do not let them bloom and repot into small pots. I have heard of a few lumps of ammonia placed under the stages being a great stimulant to restoring unhealthy plants to greater vigour, but am not a great believer in it.

H. H., LEICESTERSHIRE, asks:—Will you kindly give some information as to the cause of "spot" in our *Aërides*, also *Oncidium Lanceanum*; you will find leaves enclosed for your inspection. The temperature at night is 65° to 70°, by day 70° to 75°, and we give side ventilation cautiously.

REPLY.—The leaves of the *Aërides* Fieldingi are in some places quite rotten and badly attacked by fungus, easily seen by the aid of a microscope, and resemble grains of white sand in masses. Evidently the plants are growing in too much heat and moisture and the stove temperature is too much for them. The warm end of an Intermediate house would suit them much better. As soon as the decay is noticed make incisions with a knife on the parts affected and put in a little slaked lime. The compost during the winter should not be kept too wet.

The leaves of *Aërides odoratum* have been greatly affected by yellow thrip and the leaves are quite yellow from this cause, not by old age. See that your plants are freed from this dangerous pest.

The leaf of *Oncidium Lanceanum* is also affected by yellow or black thrip and is badly spotted, the surface of the leaf is in a very rough state from the action of these insects, not from the dreaded spot caused by wrong treatment. [See also answer to A. G., Liverpool, and W. A. G., S. Wales.]

From F. A. B. W.—With all your careful appliances for the growth of Orchids, you can have no idea of the great difficulties encountered by many a poor amateur who loves Orchids but has only a cold vinery attached to his dwelling-house and has to employ a gas or oil stove to keep out the frost. You will say it is presumptuous of such a man to try to grow Orchids under such circumstances. It may be so, but what if the poor man is passionately fond of Orchids? You know the old saying: "Fools step in where angels fear to tread." If a man *does* love Orchids, he *will* try to grow them. Do therefore help us with your advice. On page 144 of your book you give a list of Orchids which you say *might possibly succeed*. For the last half dozen years I have had out of that list, *Dendrobiums*—*chrysotoxum*, *nobile*, and *thyrsiflorum*; *Cattleyas*—*Mossae*, *Mendelii*, and *labiata autumnalis*; *Cœlogynes*—*cristata maxima* and *Massangeana*; *Cymbidiums*—*eburneum* and *Lowianum*; *Cypripediums*—*Argus*, *barbatum nigrum*, *Bozallii*, *Harrisianum*, *cardinale*, *hirsutissimum*, *insigne albo marginatum*, *Sedeni*, *punctatum violaceum*, *Leeanum superbum*, *Spicerianum*, *villosum* and *venustum*. Those in italics are either in flower or bud at the present moment (Jan. 10th). Besides these I have a good many other kinds that you do not name in the list on page 144. I give you my *lowest night* temperature from January 1st 39°, 2nd 44°, 3rd 44°, 4th 45°, 5th 45°, 6th 44°, 7th 45°, 8th 44°, 9th 45°, 10th 42°. I also give you my *highest day* temperature for the same period—January 1st 44°, 2nd 52°, 3rd 50°, 4th 49°, 5th 48°, 6th 50°, 7th 48°, 8th 50°, 9th 49°, 10th 46°. I generally have from six to ten or twelve plants in bloom every month of the year. For those fortunate persons who can keep a *very lowest minimum* of 50° your list might be largely increased. I had a plant given to me last spring of *Oncidium sphacelatum* which had been growing in a house with a minimum of 60° and kept dry and shaded for some years and it did not bloom. Since it came into my possession it has been kept moist and light, and last year all the

sunshine it could get. It grew well and has thrown up half-a-dozen very fine growths, and is a very large plant, but so far I do not see any signs of bloom. Can you give any suggestions to ensure its blooming?

REPLY.—I presume F. A. B. W. means by "perfect appliances," hot-water apparatus instead of an oil or gas stove, together with a hose pipe and a good supply of water instead of a pail of water and a syringe; more perfect ventilation gear, and so on. But these "perfect appliances" have not so much to do with successful cultivation as many may suppose; some cultivators who have all the improved methods at hand still fail to grow their plants better than those who do not possess them. Perfect appliances are invaluable in saving labour, enabling one man to do the work of two; but what the plants absolutely want is attention, and they invariably thrive if their wants are attended to. There can be no question that hot water pipes are important factors, but my correspondent has shown conclusively that Orchids can be successfully grown with only the aid of an oil stove as a heat distributor. I have the highest respect for his enthusiasm and perseverance, evidently the result of much thought and careful attention. I have no doubt many *Cypripediums*, especially those having the "insigne" blood in them, could be grown much older than they generally are. I have known some of our cold Orchids perish from cold, whilst *Cypripediums* *insigne* survived. Then again, as I have remarked in a preceding chapter, Orchids are strange plants, and even professional gardeners are often perplexed by their eccentricities. Some grow like weeds without one exactly understanding why, but the position the plant occupies has often much to do with its success or failure. A suitable position may be the direct result of some peculiarity in the structure, or from some other cause it may be almost impossible to obtain in another house. It seems evident that the position of the lean-to vinery is a suitable one for Orchids, probably in a sheltered position and with other advantageous surroundings, all assisting the lamp or stove production of heat. The oil lamp would tend to produce a dry atmosphere so necessary for such a very low temperature, and at the same time it would not fluctuate so rapidly, as is often the case. There can be no doubt that when a greenhouse or vinery is built against a dwelling-house, with the great advantage of the back wall being so adequately protected from the outside atmosphere, with probably a little extra assistance from any fire places in the walls, an immense advantage is gained in plant culture. *Oncidium sphacelatum* often indulges in this free-growing non-blooming freak. It flowers best when the pot is full of roots and the growths are near the rim of the pot. You are giving it the correct treatment to cause flower spikes to appear. It should have plenty of light, taking care that the sun is not too strong upon the plant so as to burn the foliage. When its growth is completed, give it rest by reducing the quantity of water. The flower spikes should soon be seen, as the blooms generally expand during the spring months.

C. L. B., STAFFORDSHIRE, writes:—I have just lost one of my best *Cattleyas*, and am utterly at a loss to account for the cause why one plant in a quantity should die, all the young growths being black and rotting, the others being quite healthy.

REPLY.—It is one of those troubles to which Orchid growers are liable.

I am strongly of opinion that your plant is affected with the *Cattleya* disease, and no one can give an absolute remedy for avoiding it. Such mishaps, however, may be reduced to a minimum under the influence of good cultivation. With this object in view practical cultivators urge and adopt the building up of a healthy constitution in their plants as a most important matter. Orchids, like other plants, are liable to disease, and close attention to their requirements is the best means of checking disease, though it cannot be altogether prevented. This disease, which causes the pseudobulb and leaves to turn black (*see page 51*), is no doubt a fungoid growth which is always present, but only attacks plants when their constitution, by some means or other, has been weakened and an easy prey to it. [See also answer to H. H., Leicestershire.]

E. B., LONDON, asks if *Cattleya gigas Sanderiana* is the free-flowering variety, and adds "the new growths of my *C. Gaskelliana* are curled and do not grow."

REPLY.—As to the first question you may dismiss any idea that the majority of plants called *C. gigas Sanderiana* are in any way different to the original species. Doubtless the variety first named *Sanderiana* was so named as possessing some extra merit, but I presume it was in consequence of some additional colour in the flower only. Both good and inferior varieties of this species are sometimes exceedingly shy bloomers.

Replying to the second question, I advise my correspondent to be quite sure whether the *Cattleya* Fly is infesting his plant or not (*see page 46*). New growths of Orchids sometimes assume a crippled form and from no apparent cause, though fortunately the number is small. I have now a *Cattleya labiata* that makes a malformed pseudobulb every year, and on the last occasion a bulb and flower sheath without a leaf. The most curious instance of malformation in a flower that I have had to deal with is a *Cattleya Mendelii*, which *every year* produces only a portion of a flower and always the same; it is simply two large petals, nothing more, though the growth of the plant appears to be perfect. I have been informed that the whole of a lot of imported plants sold at an auction sale on one occasion possessed this deformity when blooming.

C. F., SUSSEX, writes:—You will remember I wrote to you last year about a very fine variety of *Cattleya citrina* which received a notice in the July number of the "Orchid Review"—*C. citrina aurantiaca*. It has this season bulbs bigger than ever, and the plant has been in cultivation nine years, but only two years in my possession. I am growing it on a raft with a small amount of peat fibre, and suspended over a tank behind the door of an Intermediate vinery. I placed it in the stove close to the glass when the growths showed, so as to get them pretty well forward before dull weather came, and then removed it to the vinery. I am growing my other plants of *C. citrina* in the same way, and the bulbs have advanced in size in each of the three seasons during which the plant has been in my possession. I seem to have hit upon a position and treatment that suits them. I give them very little water, as the roots seem to me to go at the tips much more frequently when the plants are dipped often. Do you draw any distinction between *Lælia*

anceps *Williamsii* and *L. anceps Stella*, as the latter is given as a synonym of the former in "Veitch's Manual!"

REPLY.—You have hit upon the right position for successfully growing *C. citrina*, and your experience proves that it can be grown for many years without deteriorating. I have seen it do well for many years when suspended in a *Cattleya* house, but that has been in the country, where the air is clear and the maximum amount of light is obtained during winter. It is the darkness of winter, especially in large commercial districts, that is such a drawback to many of our Orchids; and those from Mexico, of which *C. citrina* is one, suffer more than any, and that is why they are so difficult to cultivate in large centres like Birmingham, where the absence of sunshine is much more prolonged than in the country owing to the atmosphere being so charged with smoke, and sulphurous fogs frequently occur which slowly but surely kill many trees and shrubs with a much harder constitution than an Orchid. There are so many varieties of white *Laelia anceps*, all more or less distinct and pretty, and a number of different names have from time to time been given to them. Scarcely two can be found exactly alike, still not distinct enough to be named as separate varieties. *L. anceps Williamsii* and *L. anceps Stella* are, I believe, very close together in appearance, the former having no colour on the lip and the latter only a slight suffusion of pink. The pure white form, which has not even any chocolate markings in the throat, is the most rare and expensive at present. There are short bulb and long bulb varieties, the latter bearing much longer and larger spikes of flowers.

A. B., LEDBURY, says:—I have several *Cattleya Gaskelliana* which have made their growth and formed their sheath, but show no signs of forming their spikes. Should I rest them now or keep them growing. I have one plant which has made its growth but no sheath; should I rest this or let it go on with next year's growth?

REPLY.—This question is answered in the reply to "H. B. E., Bristol." Generally speaking, a *Cattleya* having formed a sheath will flower, although sometimes failing to do so. Sometimes they will push a spike without a sheath, and *C. Trianae*, *C. Mendelii*, and *C. Mossiae* often produce flowers without a sheath, and on that account if the last new bulb is minus a sheath, care should be taken when cleaning the plants not to touch that particular point from which the spike should issue. In the case of *C. Gaskelliana*, should the spikes not push directly the pseudobulb is completed they will not do so, and the plant should not be kept wet and growing.

A. B., EYE, asks:—I send you leaves of a *Cattleya Eldorado* which have gone wrong in my little forcing house. About ten days ago I noticed something was the matter with it. Can you kindly inform me what you consider the cause of it, and what I am to do to stay others from being similarly affected. If other plants get it what can I do to cure them?

REPLY.—The pseudobulbs and leaves have all the appearance of the *Cattleya* disease [see answer to C. L. B., Staffordshire], although in this case they seem to have died and speedily become quite rotten, which leads me to suppose the plant has by some means received a severe check from cold, by

having too low a temperature, the plant at the same time being very wet. Is the compost in good condition?

H. B. E., BRISTOL, writes:—I think it would add much interest to your book if you could and would give us in the case of each plant: *First*, when it flowers, either during growth, as soon as growth is made, or after resting; *Second*, where the flowers spring from, top, bottom, or side. To give an illustration of what I mean, *Dendrobium nobile* flowers *after* resting. *D. chrysanthum* on new made growth; *D. bigibbum* as soon as growth is finished. Again, with *Cattleyas*, an amateur loses many flowers for a year or two through not understanding which he has to rest, and which to keep growing till the flower appears. To a beginner a knowledge of these matters would be a great help.

REPLY.—Thanks; your suggestions have my attention and I have prepared a tabulated explanation of these little matters you regard as worth knowing (*see page 146*) with index. I may, however, say here that *Cattleyas* need not cause any uncertainty in the matter of flowering. If the bulbs are strong enough they nearly always push their flowers at the right season. If the proper time of flowering is directly the bulb is formed, the flower will push up before there is time for resting, and if not then, it will fail to do so altogether, and the plant should be treated exactly the same as those which have flowered.

M. E. H., DEVONSHIRE, writes:—I have found your Orchid book of great service in every way, and I should like a list of Orchids given that require resting in a cooler house with little water. I have only one warm Intermediate house leading out of a greenhouse, and keep a good many Cool *Odontoglossums* and *Masdevallias* there, and they do not flourish, yet I am afraid to put them in the greenhouse. Your book gives so much information, but I thought a list of Orchids that *must* be rested in another house would be a great help.

REPLY.—There are so many Orchids that require resting in a cooler temperature, that your question opens up a very wide range of explanation as "resting" virtually applies to all Orchids which are inactive for a time, whilst the Intermediate-house Orchids that require rest in another house are very few. It is easy to understand that your Cool growing *Odontoglossums* and *Masdevallias* would not do well in a warm Intermediate house, although in such a house Intermediate Orchids can be grown perfectly well without moving them to another house to rest. If the winter temperature was kept right, it would be cold enough, giving quite from 10° to 20° difference of temperature below that of summer. Some *Dendrobiums* and many *Cypripediums* could also be grown in a warm Intermediate temperature, and a few of the former could be rested in the greenhouse, such as *D. nobile* and *D. Wardianum*, but as a general rule, a cool greenhouse is too cold for wintering Intermediate or Warm Orchids. It is best to be very cautious as to placing cool growing Orchids in an ordinary greenhouse, for although the thermometer might indicate the proper degree of temperature, still the atmosphere would be far too arid and harsh, and the conditions generally unfavourable to the Orchids, unless a moister atmosphere was maintained in the greenhouse than is usual. Could you not partition a portion of the greenhouse off which could be kept moist?

D. C. W., SUFFOLK, asks :—When the white fleshy roots of Orchids grow over the outside of the pots, what is their proper treatment? In many cases my pots are quite large enough for the Orchids, but their own roots will climb over, and after a time seem to wither, whereas those that keep on the surface of the pot do not, but keep on growing. I put all mine in pots after reading your remarks at page 39, and so do away to a certain extent with the risk of too great a change of temperature.

REPLY.—Where it is possible the roots should be guided or trained to penetrate the compost, doing so when the young points of the roots are close to the surface. Help is given by making holes in the compost with a small pointed stick, into which the roots enter more freely. When the roots grow over the rim and are a few inches long, they can often be brought on to the surface of the pot and pegged into position.

QUESTION 2.—In potting *Cypripediums* you say, "pot just above the rim of the pot;" so many writers say *below* the rim. Can you give more fully your reasons other than probably the obvious one, that they succeed with you your way?

REPLY.—It is frequently found that when the compost dries quickly the plants do well, but when it remains in a wet and sodden state the plants rarely do so well. Orchids are partial to a good supply of moisture at the roots, but it must pass quickly away. *Cypripediums* are not so impatient in this respect, yet they generally require a large supply of water, and in such a case the plant derives benefit from being slightly elevated above the rim, in consequence of not being so liable to be over-watered.

W. A. G., SOUTH WALES, asks :—Could you tell me the reason of the enclosed leaves of *Odontoglossum vexillarium* turning the colour they have? The plants have grown well in the *Odontoglossum* house during the summer; the leaves came out luxuriantly but all crinkled in ridges, and then turned this brown colour. I have now got the plants in the Intermediate house, and they seem to be doing better.

REPLY.—The leaves of *Miltonia* (*Odontoglossum*) *vexillaria* are badly marked by yellow Thrip. The irritation caused by these little pests by puncturing the foliage and feeding upon the sap of the plant was effected when the leaves were in a young and tender state, and the brown marks on the foliage is the result. Thrip always attacks the young growth, down the centres of which tobacco powder should be dusted. New growths often come crinkled in ridges, but ultimately become smoother. This crinkling, however, is not natural or desirable, and the leaves are sometimes affected in this way even when grown in an intermediate temperature, yet it occurs more frequently when the temperature is kept too cold or the roots too wet. You did well to remove the plants to an Intermediate house.

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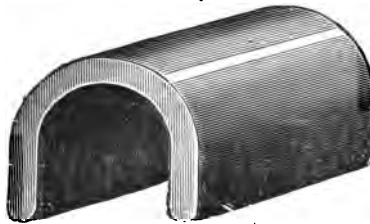
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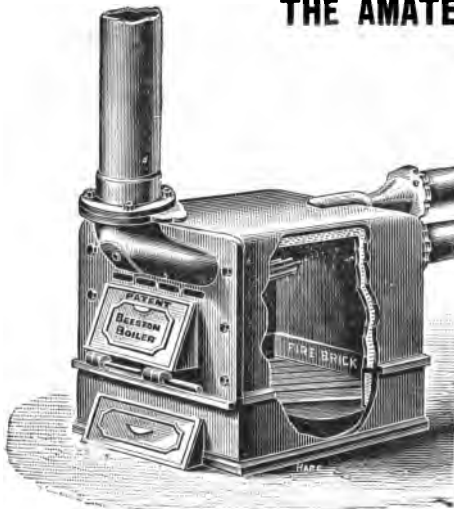


**No. 17.
2 in. to 3 in.
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4 in. Waterway.**

| No. | SIZE OF BOILER. | | | Approximate Heating Power. 4 in. Pipe. | Price of Boiler No. 17. | | | Price of Boiler. No. 18. | | |
|-----|-----------------|---------|-------|--|-------------------------------|----|----|--------------------------------|----|----|
| | long. | inside. | arch. | | £ | s. | d. | £ | s. | d. |
| 1 | 18 | 10 | 11 | 200 | 2 | 7 | 6 | | | |
| 2 | 18 | 12 | 12 | 250 | 2 | 17 | 6 | | | |
| 3 | 21 | 10 | 11 | 225 | 2 | 15 | 0 | | | |
| 4 | 21 | 12 | 12 | 275 | 3 | 2 | 6 | | | |
| 5 | 24 | 10 | 11 | 250 | 2 | 17 | 6 | | | |
| 6 | 24 | 12 | 12 | 300 | 3 | 7 | 6 | | | |
| 7 | 24 | 14 | 14 | 350 | 3 | 17 | 6 | 5 | 17 | 6 |
| 8 | 27 | 12 | 12 | 325 | 3 | 15 | 0 | 5 | 12 | 6 |
| 9 | 27 | 14 | 14 | 375 | 4 | 5 | 0 | 6 | 10 | 0 |
| 10 | 30 | 12 | 12 | 350 | 4 | 0 | 0 | 6 | 2 | 6 |
| 11 | 30 | 14 | 14 | 425 | 4 | 17 | 6 | 7 | 2 | 6 |
| 12 | 33 | 12 | 12 | 400 | 4 | 10 | 0 | 6 | 15 | 0 |

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| Height. | Width. | To heat 4 in. pipe. | £ s. d. | | |
|---------|--------|------------------------|---------|----|----|
| | | | £ | s. | d. |
| 24 | 15 | 36 ft. | 2 | 15 | 0 |
| 23 | 16 | 90 ft. | 4 | 0 | 0 |
| 29 | 16 | 260 ft. | 5 | 10 | 0 |

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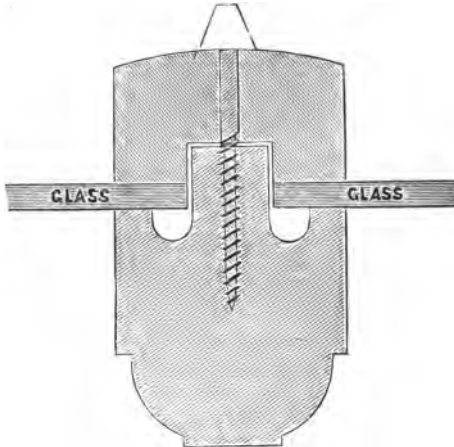
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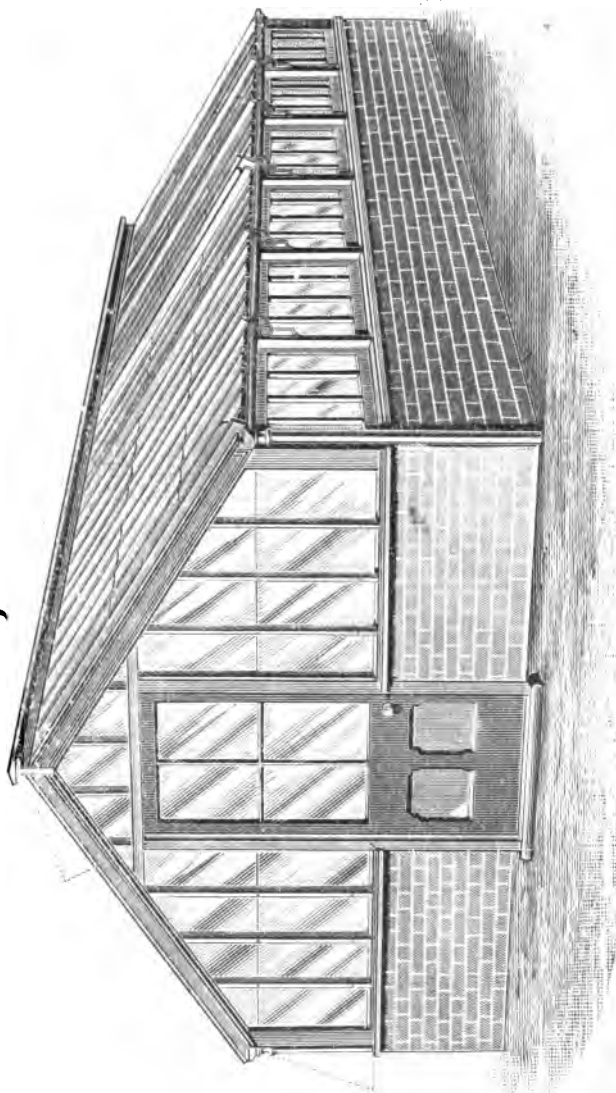


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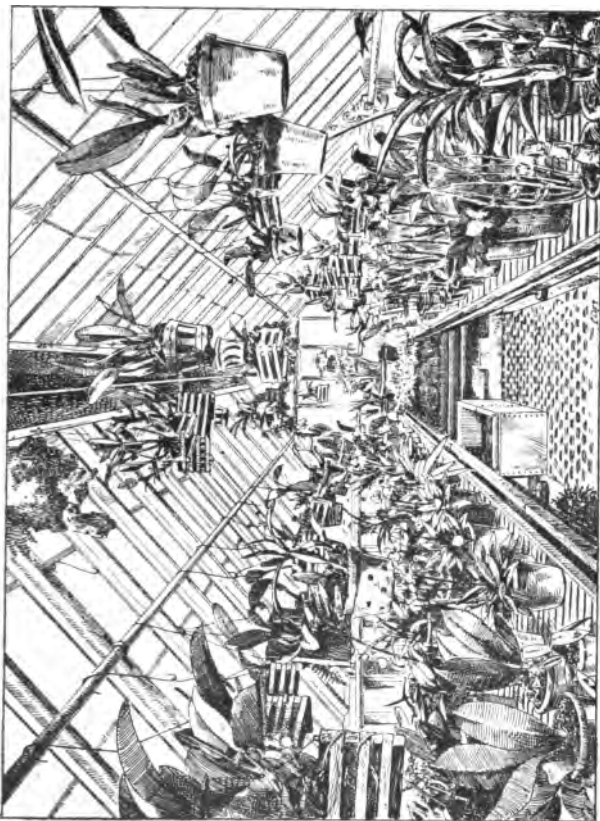
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